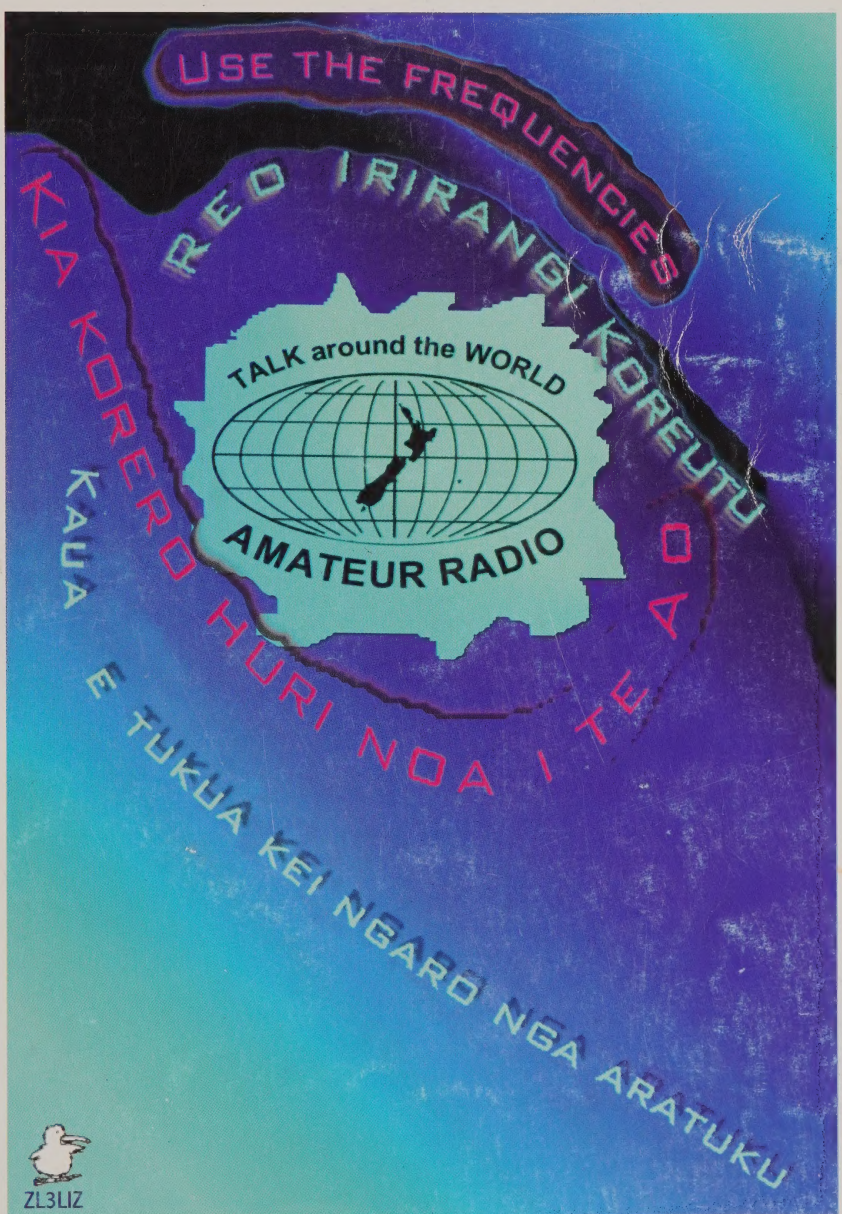
NEW ZEALAND AMATEUR RADIO

CALLBOOK

AND RADIO REFERENCE

2000/2001



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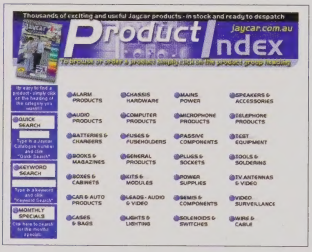

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An example of Amateur Radio serving the wider Community

The Amateur's Code

The Amateur is Considerate ...
never knowingly using the air in such a way as to lessen the pleasure of others.

The Amateur is Loyal ...
offering loyalty, encouragement and support to fellow radio amateurs, local clubs and to the New Zealand Association of Radio Transmitters, through which Amateur Radio is represented in New Zealand.

The Amateur is Progressive ...
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The Amateur is Friendly ...
slow and patient sending when requested, friendly advice and counsel to the beginner, kindly assistance, co-operation and consideration of the interests of others; these are the marks of the amateur spirit.

The Amateur is Balanced ...
radio is a hobby. It is never allowed to interfere with any of the duties owing to home, job, school, or community.

The Amateur is Patriotic ...
with knowledge and station always ready for the service of country and community.

—PAUL M. SEGAL
ex-W3EEA, W9EEA
(Amended by the Editor)

2000/2001 NEW ZEALAND AMATEUR RADIO CALL BOOK AND RADIO REFERENCE

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AMATEUR RADIO

What is Amateur Radio?

Amateur Radio, also affectionately known as "ham radio", is a hobby of constructing, experimenting and communicating. In New Zealand hams are licensed by the Ministry of Economic Development (Radio Spectrum Management). Once licensed, an amateur can operate radio equipment from home, from their vehicle and from anywhere in New Zealand. A number of radio frequencies have been set aside for Amateur Radio use. On these frequencies a ham can talk across town or around the world. The scope and possibilities are endless—from sending TV pictures to operating through Amateur Radio satellites.

Who can be Hams?

Just about anyone can become a ham. Some famous people such as Kings and Prime Ministers are hams, but most are just people from all walks of life who like communicating. Young people find Amateur Radio a great training ground, older people find "hamming" an absorbing retirement hobby.

In fact Amateur Radio is more than a hobby, it is a service. Hams provide their equipment and operating skills whenever the need arises—such as for Civil Defence emergencies and Search and Rescue operations.

How do I become a Ham?

Passing a ham licence is quite easy. For a Novice Licence you are required to obtain a 30 per cent pass in a test on radio theory, a 50 per cent pass in understanding Radio Regulations and a morse code sending and receiving test at six words per minute.

Where do I get more information?

The New Zealand Association of Radio Transmitters (Inc.) is a non-profit association of Amateur Radio Operators. NZART has clubs and instructors in most larger cities and towns. For more information on Amateur Radio and details of club and licensing courses near you, contact:

The Business Manager, NZART, Freepost 3565, P.O. Box 40-525, Upper Hutt.

Email: nzart@nzart.org.nz World Wide Web: http://www.nzart.org.nz

New Zealand Association of Radio Transmitters INC

(Founder Member of the International Union Region III)

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Amateur Radio *Call Book* published annually

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Teletext for current news and promotion

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Slow Morse Practise for Amateur Radio Operators' Certificate

Monitoring Service to protect our bands

Contests and Awards administration; branch, national and international

Annual Conference, our national forum

VHF Convention for VHF constructors and experimenters

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Third Party Insurance for NZART activities, Branches and AREC

Education and Development Group for co-ordination of Radio Training

Examination Division—organisation of Amateur Operator Certificate examinations

Bulletin Board Systems for up-to-date information and messages

Special Projects for funds for promoting radio in developing countries

Legal Advice on tower permits

Branch Services constitutional, legal, financial, etc.

The Constitution of the New Zealand Association of Radio Transmitters Incorporated

is available from:

The Business Manager, NZART, Freepost 3565, PO Box 40-525, Upper Hutt 6415
or NZART URL: http://www.nzart.org.nz/nzart nzart@clear.net.nz

EDITORIAL

This year we have produced a full-sized *Call Book*. All contributors have reviewed, revised and, in many cases, re-written their sections to give us the best and latest information on our great hobby of Amateur Radio.

The Branch Directory has been prepared from returns sent in by Branches. However, there are several Branches which have not sent in their information.

As editor I have been fascinated by the wealth of detailed information that is available in *Call Book* and I hope each one of you will take time to study it in depth.

I express, on your behalf, our thanks to those who have made the 2000–2001 *Call Book* a success.

Sefton Tillman ZL3AIX

Call Book Editor

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NZART Headquarters

—Application for membership
—Subscription renewals
—Publications department
—Change of address
—General enquiries

Note: Membership number and Call-sign should be on all correspondence. Please include a Break-In *wrapper if available.*

NZART Headquarters

Visitors welcome.
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5th Floor Astral Tower Building
(entrance on west side of building)
88–90 Main Street
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Postal: P.O. Box 40-525, Upper Hutt 6415
Telephone: (+64-4) 528-2170
Fax: (+64-4) 528-2173
E-mail: nzart@nzart.org.nz

NZART Subscriptions

2000/2001

Annual Subscription	$80.00
Student Subscription	$30.00
Family Additional	$30.00
Maximum Family	$110.00
Overseas	$80.00

A rebate of $5.00 applies for payment prior to October 31. See *Break-In* for details.
Concessionary membership on application to the Business Manager

Call Book 2000/2001	$14.00
Break-In Single copy	$5.00

***Break-In* Editor:**
J. R. L. Walker ZL3IB

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—All articles and letters to the Editor:

E-mail: break-in@nzart.org.nz

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Break-In
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***BREAK-IN* DELIVERY PROBLEMS**
Advise the Business Manager
PO Box 40-525, Upper Hutt 6415

Official Broadcasts:
J. A. Meachen ZL2BHF
E-mail. zl6a@nzart.org.nz

The monthly NZART Official Broadcast is made by:
ZL6A, AUCKLAND
3900kHz LSB
on the last Sunday of each month except December, when the broadcast is made on the Sunday before Christmas.

The broadcast is also made on the National System and some VHF repeaters. A list of these can be found in *Break- In*.

The time of the broadcast is 2000 hours. A repeat broadcast is made at 2100 hours.

Members and Branches are welcome to submit material to ZL2BHF, C/- NZART Headquarters, PO Box 40-525, Upper Hutt 6415, for inclusion in the broadcasts.

CONFERENCE OFFICIAL BROADCAST
The Official Conference Broadcast is held on the Sunday of Queen's Birthday Weekend at 2000 hours.

NATIONAL DIRECTOR AREC:
Brian E. Purdie ZL2TPS
E-mail: arec@nzart.org.nz

AREC Section Leaders Net
A monthly net of all AREC Section Leaders is held on the third Monday of each month at 1930 hours. Net is conducted by the MANAGER AREC, ZL3EX on 3900kHz Upper Sideband.

Monitoring Service Co-ordinator:
Ted Minchin ZL1MT
E-mail: ms@nzart.org.nz

The NZART Monitoring Service is part of the IARU Monitoring System, a world-wide system of Amateur monitoring stations, concerned with the activities of non-amateur stations in amateur bands.

The primary object of the Monitoring Service is to identify, report, and have removed, all non-amateur stations in the exclusive amateur bands.

Additionally, the Service monitors our bands for statistical purposes to support submissions on band usage. Reports on "Intruders" should be sent to ZL1MT, *Call Book* address.

FMTAG
Chairman: David Andrews ZL2SX
Secretary: Jamie Pye ZL2NN
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Fax: (03) 343-0461
E-mail: webmaster@nzart.org.nz

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1926–27	E. A. Shrimpton	Z2XA
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1972*	M. R. O. Montgomery	
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*Denotes deceased.

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ZL2EX	Area ManagerZL2	Jeff Sayer	ZL2TFZ	(04) 527-9648	(04) 560-2722	Terry Waghorn	ZL2AYY	(04) 475-9761	(025) 887-271
ZL3EX	Area ManagerZL3	Stan Whitfield	ZL3AP	(03) 358-3089	(03) 364-2428	Gareth Bradshaw	ZL3VP	(03) 332-2406	(03) 363-9797
ZL4EX	Area ManagerZL4	Bill Olsen	ZL4TAB	(03) 455-7884	(025) 369-107	Bob Smith	ZL4OC	(03) 477-0969	(03) 479-5071
ZL2EG	Land SAR Liason	Jeff Sayer	ZL2TFZ	(04) 527-9648	(04) 560-2722				
	Training	Jim Rowe	ZL1AVR	(07) 868-9193					

AREC Section Leaders and Deputies

E.Call	Section	Section Leader	Call	Home	Work	Deputy Leader	Call	Home	Work
ZL1EA	Auckland	Arnold Gibbons	ZL1MA	(09) 533-8574		Don Webster	ZL1CY	(09) 575-5906	(09) 575-5554
ZL1EB	North Shore	Terry James	ZL1UFY	(09) 419-1958	(09) 302-6688	Alan Wooller	ZL1AUW	(09) 444-2423	(09) 309-1390
ZL1EC	Hamilton	John Lisignoli	ZL1UST	(07) 855-5912		David Nation	ZL1TCE	(07) 843-0108	(07) 834-6767
ZL1ED	Te Awamutu	Steve Carran	ZL2SR	(07) 847-6701		Mervyn Owen	ZL2AVY	(07) 871-9992	
ZL1EE	Taumarunui	Lew Palmer	ZL1TIG	(07) 895-8113	(07) 895-8260	Jim Allison	ZL1AO	(07) 896-7451	
ZL1EF	Waihi	David McGuire	ZL3DM	(07) 863-5484		Peter Anderson	ZL1LR	(07) 863-7546	(07) 863-7546
ZL1EG	Northland	Brian Winger	ZL1TBW	(09) 436-0262	(09) 438-8232	Don Ewen	ZL1UOH	(09) 432-0185	(025) 974-356
ZL1EI	Thames	Jim Rowe	ZL1AVR	(07) 868-9193		Ken Hayhurst	ZL1ATU	(07) 868-7330	(07) 868-0000
ZL1EJ	Tauranga	Gordon Cooper	ZL1KL	(07) 548-1286	(025) 239-0527	Russel Miller	ZL1CAK	(07) 578-5521	
ZL1EK	Western Suburbs	Paul Granger	ZL1JC	(09) 820-0676	(09) 376-6191	John Turnwald	ZL1JT	(09) 827-3538	
ZL1EL	Cambridge	Tony Boyce	ZL1AFV	(07) 827-6107	(07) 827-7358	Des Hamblyn	ZL1HP	(07) 827-6247	
ZL1EM	Eastern B.O.P.	Alan McDonald	ZL1PI	(07) 308-7740	(07) 308-8967	Les Clark	ZL1BQX	(07) 308-8615	
ZL1EN	Franklin	Bob Holt	ZL1BBZ	(09) 235-9549		Herman Heyer	ZL1DYC	(09) 233-4320	(09) 233-4320
ZL1EO	Kawerau	Barry Liddle	ZL1CAY	(07) 323-8970	(07) 323-3860	Ray Dyer	ZL1AIS	(07) 323-6199	
ZL1EP	Waitomo	Mick Gannon	ZL1HJ	(07) 878-7140		Andrew Leadley	ZL4SQ	(07) 877-8675	
ZL1EQ	Rotorua	Graeme Hunt	ZL1ANH	(07) 349-1581	(07) 348-6852	Peter Dare	ZL1PJ	(07) 345-6469	(07) 347-5899
ZL1ER	Tokoroa	Graham Henley	ZL1GDH	(07) 886-6498	(07) 886-1761	Brian Williamson	ZL1BYO	(07) 886-5658	(07) 886-6109
ZL1ES	Papakura	Richard Gamble	ZL1BNQ	(09) 537-1238	(09) 272-0114	David Karrasch	ZL1TTS	(09) 298-5271	(09) 266-0180
ZL1ET	Taupo	Graham Messenger	ZL1BVO	(07) 378-4162		Roger Simmonds	ZL1UTW	(07) 378-9676	
ZL1EU	Manukau	Jim Milligan	ZL1BAM	(09) 576-9163	(09) 528-8916	Ian Lindsay	ZL1AMR		
ZL1EV	Te Puke	Bernie Rickard	ZL1TKY	(07) 573-9856		Syd Rowe	ZL2ULA	(07) 533-1029	(07) 577-0288
ZL1EW	Rodney	Mike Ryan	ZL2MR	(09) 425-4401		Jim Goodsir	ZL1BJI	(09) 425-5944	
ZL1EY	Opotiki	Jim Jones	ZL1JRJ	(07) 315-7067		Steve Winder	ZL1ACE	(07) 315-7333	
ZL1EZ	Northern Wairoa	Les Ward	ZL1BIW	(09) 439-7079		J. Bakulich	ZL1BAU	(09) 439-7975	(09) 439-7600
ZL6EA	Far North	Russell Shackleton	ZL1BQK	(09) 408-0057	(09) 408-0190	Brian Tarlton	ZL1BAY	(09) 408-1447	
ZL6EB	Te Aroha	Brian McConnochie	ZL1BWK	(07) 884-8871	(07) 884-8189	Grant Horn	ZL1UNX	(07) 884-5720	
ZL6EC	Hibiscus Coast	Blair Jackson	ZL1NV	(09) 415-9300	(09) 415-7377	John Bell	ZL1FB	(09) 424-5725	
ZL6ED	Mercury Bay	Geoff Penney	ZL1APO	(07) 866-4703	(07) 866-0035	Jack MacLardy	ZL1TIR	(07) 866-5876	
ZL6EE	Auckland VHF Grp.	Doug Cooke	ZL1TTE	(09) 846-6075	(09) 815-2299	Peter Loveridge	ZL1UKG	(09) 377-3398	
ZL2EA	Gisborne	Mike Mather	ZL2CC	(06) 867-7705	(06) 868-5381	Ian McLachlan	ZL2IMM	(06) 868-8653	(06) 868-4134
ZL2EB	New Plymouth	Wayne Gaudin	ZL2VN	(06) 753-5800	(06) 753-6139				
ZL2EC	Motueka	Robin Reeve	ZL2FZ	(03) 528-6868					
ZL2ED	Wanganui	Craig Mills	ZL2MD	(06) 345-0766		Tony Shearman	ZL2ALO	(06) 344-6110	
ZL2EE	Hastings	Robert Wallace	ZL2SG	(06) 878-4993	(06) 878-7119	John Newson	ZL2VAF	(06) 876-3218	(06) 878-3066
ZL2EF	Kapiti	Len Blackley	ZL2TFP	(04) 298-7048	(04) 472-6881	Dennis Young	ZL2BFI	(04) 298-6664	
ZL2EG	Wellington VHF	Jeff Sayer	ZL2TFZ	(04) 527-9648	(04) 560-2722	John Yaldwyn	ZL2TRV	(04) 478-3222	(04) 499- 6000
ZL2EH	Tararua District	Riki Allison	ZL2BRU	(06) 374-9321		Steve Cooper	ZL2WAU	(06) 374-8288	(06) 376-4745
ZL2EI	Manawatu	Bruce Galley	ZL2WBG	(06) 357-4227		Barrie Angland	ZL2WBA	(06) 356-8448	(06) 355-4468
ZL2EJ	Wairarapa	David Bray	ZL2UCW	(06) 378-8288	(025) 666-1937	Gavin McAnulty	ZL2VGB	(06) 377-3978	(06) 378-2099
ZL2EK	Rahotu Coastal	Peter McNeil	ZL2BQW	(06) 761-8028		Tom Clouston	ZL2AQP	(06) 761-8082	
ZL2EL	Upper Hutt	Gavin Smith	ZL2ACT	(04) 970-8533	(025) 226-5719	Arnold Darby	ZL2ASD	(04) 526-6710	(04) 526-6710
ZL2EN	Nelson	David Holland	TBA	(03) 548-5414	(025) 754-005	K. Simpson	ZL2TBE	(03) 523-9183	
ZL2EO	Marlborough	Paul Rennie	ZL2NBP	(03) 578-5311	(03) 578-4039	Gary Ching	ZL2BTV	(03) 578-4102	(03) 578-4102
ZL2EP	Inglewood	Tarry Martin	ZL2KV	(06) 756-7627		Graham Meads	ZL2TGM	(06) 756-7998	(06) 756-7194
ZL2EQ	Napier	Duncan Frew	ZL1UIO	(06) 844-5367	(06) 844-2129	John Lane	ZL2ARF	(06) 844-3266	
ZL2ER	Waimarino	Bill Luscombe	ZL2AVL	(06) 387-6707		Dave Inkster	ZL2BLI	(06) 385-8596	(06) 385-8361
ZL2ES	Horowhenua	Steven Knight	ZL2UKC	(06) 367-9509		Alan McLauchlan	ZL2AVA	(06) 368-9274	
ZL2ET	Titahi Bay	Ron Blackwood	ZL2OY	(04) 232-5587		Brian Amies	ZL2AYF	(04) 232-6378	(04) 232-4954
ZL2EV	Patea	Graeme Bateman	ZL2BHD	(06) 278-4793		Peter Williams	ZL2AID	(06) 278-4292	(06) 278-4026
ZL2EW	Marton	Brian Purdie	ZL2TPS	(06) 329-3606	(06) 351-5309	Joe Abrahams	ZL2JOE	(06) 327-8524	
ZL2EY	Hutt Valley	Bob Sewell	ZL2ASO	(04) 564-6929		Dave Williams	ZL2UTL	(04) 564-6713	
ZL7EA	Feilding	Gil Hitchman	ZL2BNA	(06) 323-5847		A. Abel	ZL2QR	(06) 323-6538	
ZL7EC	Waitara	To be advised				Ian Cash	ZL2BRA	(06) 754-6183	(06) 755-0900
ZL7ED	Sth.Wairarapa	Neil Rait	ZL2BLM	(06) 308-9341		Bob Pearce	ZL2GJ	(06) 306-9798	
ZL3EA	Christchurch	Steve Davis	ZL2UCX	(03) 348-0360	(03) 339-1419	Jeni Deans-Syddall	ZL3TCG	(03) 358-3089	(03) 318-0803
ZL3EB	Westland	John Melse	ZL3VLJ	(03) 762-6549		Kevin O'Sullivan	ZL3ABY	(03) 768-7598	(03) 768-9300
ZL3EC	Sth.Canterbury	Glenn May	ZL3GL	(03) 686-0306	(03) 688-9073	Paul Streeter	ZL3PS	(03) 684-5030	(03) 688-8628
ZL3ED	Ashburton	Les Vincent	ZL3UX	(03) 303-6306	(025) 411-647	L Moller	ZL1VF	(03) 308-1007	
ZL3EE	Sth.Westland	Ron Searle	ZL3MY	(03) 755-6741					
ZL3EF	Reefton Buller	Kerry Silverwood	ZL3CG	(03) 789-9750		John Kilkolly	ZL3SO	(03) 789-7004	
ZL3EG	Nth.Canterbury	Geoff Gillman	ZL3QR	(03) 313-7137		Ian Hewson	ZL3CE	(03) 327-6647	
ZL3EH	Kaikoura	Bill Jackson	ZL3PZ	(03) 319-5981		H. Bryant	ZL3GB	(03) 319-5897	
ZL4EA	Otago	Dave Stevenson	ZL4SB	(03) 454-2527	(03) 455-5440	Alan Cross	ZL4QK	(03) 482-1700	
ZL4EB	E. Southland	Dick Whyte	ZL4AQ	(03) 208-6793		Alastair Allan	ZL4AO	(03) 208-7288	
ZL4EC	Southland	Neville Checketts	ZL4OX	(03) 216-6599	(025) 377-431	Crosbie Stewart	ZL4TIC	(03) 216-3060	
ZL4ED	Balclutha	John Blair	ZL4AM	(03) 415-7849		Phil Beeby	ZL4TGU	(03) 418-2337	(03) 418-1239
ZL4EE	Centr.Otago	Peter Leigh	ZL2APO	(03) 445-1798		Wattie Beveridge	ZL4ST	(03) 448-6880	(03) 448-8038
ZL4EF	North Otago	Neil McLeod	ZL4SN	(03) 434-7253		Gary Millar	ZL4TA	(03) 434-5993	(03) 434-5029
ZL4EG	Queenstown	Russ Watson	ZL4JW	(03) 442-9374	(03) 422-6772	Dave Allison	ZL2TSI	(03) 442-5258	

AREC records have been updated from Branch Advice Notes. Any additions or omissions to AREC Secretary.

BRANCHES AND MEMBERSHIP

A Policy Statement by Council (Revised 1995)

Members will be aware of the requirement in paragraph 27 of the Association's Constitution that Branches must not admit to membership persons who hold an amateur station licence, but who are not members of the Association.

Over the years there have been attempts to repeal or modify these provisions, but successive National Conferences have made it quite clear that members will have none of it. The rationale for this Constitutional provision is that it provides at least one way in which non-members can be denied the privileges which membership of the Association brings. We cannot stop our non- member brethren enjoying some benefits—such as the negotiations the Association conducts with the licensing authorities, the use of repeaters, and the enjoyment of the benefits which band plans bring. Council is firmly of the view that it is unfair to those who do pay their subscriptions if the lot of non-members is made easier by the ready availability of members' privileges which the Association is, in fact, able to withhold. Further, the Association has to take into account the feelings of its many voluntary workers, who devote many hours to Association matters, and, in addition, pay their subscriptions as well. These persons have even greater cause to complain if the Association makes benefits available to non-members who do not contribute to these benefits by at least joining the Association and paying a subscription.

Branch Officers

It is disturbing to Council to find that some Branches not only fail to have regard to their Constitutional obligations by ensuring that licensed amateurs who are not Association members do not join the Branch, but even have as Branch Officers persons who are licensed amateurs but not members of the Association. This is clearly unconstitutional. If an Officer is not an Association member, but is a licensed amateur, then there is a breach of the Association Constitution. This should also be a breach of the Branch Constitution— if it is not, the Branch Constitution is faulty and must be brought into line. (See the Association's Constitution, paragraph 27.)

Regrettably, there are still one or two clubs that indulge in a fiction— they attempt to evade their responsibilities to NZART, whether arising under paragraph 27 or otherwise, by purporting to distinguish between the local club and the NZART branch. This fiction ignores the realities, and is not acceptable. The reality is that the local club itself is the NZART Branch, and the Branch Constitution must be changed to reflect this commitment to NZART if that is necessary. Any attempt (for that is all it is) to circumvent the Association Constitution by resorting to this fiction is unfair to the local NZART members, other NZART members, and the Association itself.

Relationship between Branches and the Association

Sometimes, Branch members criticize these rules, often using catch phrases such as "breach of human rights", or "interference with independent clubs". These provisions of the Association Constitution are nothing of the sort. They are part of the contract that members make when they join the Association. By applying to become or by remaining an Association Branch, the Clubs or Branches surrender their independence to the extent required to conform with the Association's Constitution. Branches are expected to keep their houses in order; if they are not prepared to do this, then they should surrender their status as a Branch. There is nothing in the Human Rights Act to prevent the Association and its Branches from discriminating between members and non-members.

Whose job is it to be the policeman?

The answer is—nobody's and everybody's. The Association's Constitution does not specifically charge Council or any Officer with the task of enforcement. So long as we remain members, we are all parties to the contract represented by the Constitution and we each individually have that responsibility. If a Branch is Incorporated in its own right, then the Branch in its corporate capacity also has that duty.

Hardship

Hardship is not a ground for failing to become an Association member. Association subscriptions can be remitted under paragraph 7(e) of the Association's Constitution and Council will authorize this where there is genuine hardship. But Council's experience has been that the genuine hardship is rare indeed. Many claims of hardship over the years have been found, on enquiry, not to be genuine. Application for this concession should be made in person by the member. Council will then usually discreetly seek further information from the Branch. Council would expect there to be no more than half a dozen such cases throughout the country at any one time. The privacy of the applicant is respected by ensuring that as few persons as possible within the Association are aware of the Application.

Why are we telling you this now?

Council has never said anything else. But there are now some situations which create special problems for the Association.

The Association enters into contracts with public corporations and SOEs relating to right of entry for the siting of repeaters. These contracts recognize potential liability and require the Association as a condition of the contract to take public liability insurance which could be up to $2 million or more. This insurance will be taken on terms which will extend to protect both the Association and individual members. Naturally, the corporations we are dealing with take comfort in this insurance, as they know that while the insurance is in place the Association has the indemnities required to meet any claims. This means that to come within the Association's cover, individuals must be members, as the Association has no intention of paying additional premiums to insure against the actions of non-members. If an individual incurs liability as agent of the Association, then that individual must be a member to take the benefit of any cover the Association arranges. The Association will not appoint non-members as its agents, as this would nullify the insurance cover.

As Branches have responsibility with the Association for repeaters, Branch Officers are required to be Association members. This is not more than the Constitutional requirement. Because of these matters, Council will, in future, have to be more active in seeing that the Constitution is observed.

As the appointment of repeater trustees is an Association matter, even if exercised through Branches, repeater trustees must also be members. This, likewise, is a necessary consequence of the provisions of the Constitution. Council, in future, will have to ensure that repeater trustees are Association members, not only because this is a Constitutional requirement, but also to ensure that the persons responsible for the operation of repeaters have adequate insurance cover to meet the requirements of our contracts with the public corporations.

Action

Take action now to ensure that your Branch complies with the Association's Constitution. Your Councillors will help you with advice as required.

This policy statement was first published in the August 1990 Break-In. It is now reissued in a slightly revised form.

NZART Council

CHANGE OF ADDRESS NOTIFICATION

Please send to the Business Manager any details of your new address to retain your membership benefits, including the automatic inclusion of your details in Call Book (published annually).

If you DO NOT wish your details to be published please indicate this fact clearly.

REMEMBER: If you change your address you must notify the nearest office of the Ministry of Economic Development (Radio Spectrum Management), AND the Business Manager NZART.

NZART BRANCH DIRECTORY

Alphabetical List of Branches

01M	Ashburton	16C	Horowhenua	73N	Northern Wairoa	39N	Tauranga
02N	Auckland	79N	Howick	64S	Oamaru	77N	Te Aroha
66N	Auckland VHF	17N	Huntly—in recess	72N	Opotiki	40N	Te Awamutu
35S	Balclutha	18C	Hutt Valley	30S	Otago	53N	Te Puke
04V	Cambridge	18C	Inglewood—in recess	31C	Pahiatua	41N	Thames
15C	Central Hawkes Bay	76M	Kaikoura	65N	Papakura	42C	Titahi Bay
61S	Central Otago	69C	Kapiti	54C	Patea	57N	Tokoroa
05M	Christchurch	67N	Kawerau	75S	Queenstown	63C	Upper Hutt
56M	Christchurch West	20C	Manawatu	83N	Raglan	43N	Waihi
51N	Eastern Bay of Plenty	59N	Mangakino	32C	Rahotu Coastal	81N	Waikato VHF
08S	Eastern Southland	21N	Manukau	62M	Reefton-Buller	45C	Waimarino
09C	Egmont—in recess	22C	Marlborough	71N	Rodney	46C	Wairarapa
78N	Far North	23C	Marton	33N	Rotorua	47C	Waitara
70C	Feilding	44N	Matamata	34M	South Canterbury	55N	Waitomo
10N	Franklin	24C	Motueka	36M	South Westland	48C	Wanganui
11C	Gisborne	25C	Napier	82C	Southern Wairarapa	50C	Wellington
12N	Hamilton	26C	Nelson	37S	Southland	74C	Wellington VHF
13C	Hastings	27C	New Plymouth	86N	Suburban	03N	Western Suburbs
14C	Hawera	68M	North Canterbury	06C	Tararua	49M	Westland
58N	Helensville—in recess	29N	North Shore	38N	Taumarunui	28N	Whangarei
80N	Hibiscus Coast	52C	Northern Hawkes Bay	60N	Taupo		

Letter after Branch number denotes electoral district—N=Northern, C=Central, M=Midland, S=Southern

Affiliated Branches: Canterbury Amateur Radio Development Society Inc; Suburban Amateur Radio Club Inc.

01 Ashburton
Physical Address: Ashburton Aviation Museum, Ashburton Airport
Postal Address: C/- 89 Creek Rd, Ashburton 8300
E-mail packet@inet.net.nz
Branch Call-sign: ZL3AF
President: Gordon Mattingley ZL3AQ
Secretary: Morry Turner
Net Information: 144.600 on Mondays at 2030 except club nights
Contact Person: Brian Rickard ZL3TJW
Contact Phone Number: (03) 308-8599 (025) 229-5799
Meeting Information: Second Monday each month (except January) at 1930

02 Auckland
Physical Address: 400 St Johns Road, Meadowbank
Postal Address: PO Box 18-003, Glen Innes, Auckland 1130
Branch Call-sign: ZL1AA
President: Gwynne Rowe ZL1RGR
Secretary: Neil Cromarty ZL1CWD
Net Information: 146.600 on Mondays at 2015 & 3645KHz on Mondays at 2100
Contact Person: Selwyn Ross ZL1BRC
Contact Phone Number: (09) 575-8847 Web page http://www.qsl/zl1aa
Packet: ZL1AA@ZL1AB
Web: http://www.nzart.org.nz/nzart/branches/ak1/branch02/zl1aa.html
Meeting Information: Third Tuesday each month (except January) at 1930. Midweek last Wednesday (except December) at 1300.

03 Western Suburbs Radio Club (Inc)
Physical Address: 3000 Great North Road, New Lynn, Auckland
Postal Address: PO Box 15-122, New Lynn, Auckland 1232
Branch Call-sign: ZL1AC
President: Barry Williams ZL1ACZ
Secretary: Roy Milam ZL1WI
Net Information: 3622 kHz on Fridays at 1930. 146.525 on Wednesdays at 1930
Contact Person: Ross W. Redell ZL1VRR
Contact Phone Number: (09) 629-0504
Meeting Information: Second Monday of each month at 1930 (except January)

04 Cambridge Radio Club
Physical Address: Cambridge Community Seminar Centre, 22a Taylor Street
Postal Address: PO Box 650, Cambridge 2351
Branch Call-sign: ZL1HP
President: Peter Sadgrove ZL2UJ
Secretary: Ian Honey
Contact Person: Des Hamblyn ZLHP
Contact Phone Number: (07) 827-6247
Meeting Information: Every Tuesday of each month at 1930

05 Christchurch Amateur Radio Club
Physical Address: 27 Galbraith Avenue, Avonside, Christchurch
Postal Address: PO Box 1733, Christchurch 8015
Branch Call-sign: ZL3AC
President: Des Rowe ZL3AK
Vice President: Rob Thirkettle ZL3RX
Secretary: Mike Barnes ZL3TMB
Net Information: Canterbury 725 (if available, otherwise on 705 repeater) on Sundays at 2000
Contact Person: Des Rowe ZL3AK
Contact Phone Number: (03) 384 2514 E-mail dr.cr.rowe@xtra.co.nz
Meeting Information: First Wednesday each month February to December at 1930. AREC meets on the second Wednesday at 1930. "Social get-together" every Tuesday night 1930 till late February to December.
Web page: http//www.nzart.org.nz/nzart/branches/chch/branch05/

06 Tararua District Radio Club
Physical Address: Woodville Racing Club Tea Kiosk
Postal Address: 59 Cadman Road, Dannevirke
Branch Call-sign: ZL2IB
President: Joe Ward ZL2AX
Secretary: Dave Turner ZL2ABT
Net Information: 146.650 (Whariti Repeater) on Fridays at 2100
Contact Person: Dave Turner ZL2ABT
Contact Phone Number: (06) 374-7990
Meeting Information: Second Sunday each month Woodville Racecourse Tea Kiosk 1400.

08 Eastern Southland
Postal Address: C/- R. W. McIntosh, 59 Hamilton Street, Gore, Pukerau 9700
Branch Call-sign: ZL4AL
President: Gerry Christie ZL4AV
Secretary: Ron McIntosh ZL4RH
Contact Person: Neil Gilder ZL4GL
Contact Phone Number: (03) 208-4192
Meeting Information: Fourth Wednesday each month at various venues at 1930

09 Egmont
In Recess

10 Franklin Amateur Radio Club (Inc)
Physical Address: Stadium Drive, Pukekohe
Postal Address: 25 John Street, Pukekohe 1800
Branch Call-sign: ZL1SA
President: Fred Bain ZL1SP
Secretary: Tom McDonald ZL1TMC
Net Information: 3700 kHz on Sundays at 0900. Bombay 690 on Sundays at 0930
Contact Person: Monty Armstrong ZL1US
Contact Phone Number: (09) 238-6567
Meeting Information: Third Tuesday each month at 2000
Web: http://www.nzart.org.nz/nzart/branches/akl/branch10/farc.html

11 Gisborne Amateur Radio Club
Physical Address: Gisborne Cosmopolitan Clubrooms, Grey & Derby Streets, Gisborne
Postal Address: PO Box 1017, Gisborne 3815
Branch Call-sign: ZL2AA
President: Alan Mackintosh ZL2AOP
Vice President Mike Mather ZL2CC
Secretary: Simon Smith ZL2RY
Net Information: 3685 kHz every evening from 2030. 146.800 every evening 1800 BBS: ZL2AA
Contact Person: Rib Compier ZL2AJQ
Contact Phone Number: (06) 868-8636 E-mail simonz12ry@hotmail.com
Meeting Information: General and Committee second Monday each month at 1930

12 Hamilton Amateur Radio Club
Physical Address: 88 Seddon Road
Postal Address: PO Box 606, Hamilton 2015
Branch Call-sign: ZL1UX
President: Kevin Morton
Secretary: Phil King ZL1PK
Net Information: 3575 kHz on Mondays at 1930. 146.525 on Tuesdays at 2000
Contact Person: Phil King ZL1PK.
Contact Phone Number: (07) 847-1320
Meeting Information: General third Wednesday of each month at 1930, Committee second Wednesday at 1930

13 Hastings/Havelock North
Physical Address: Waimarama Surf Lifesaving Rooms, Grove Road
Postal Address: C/- Brian Fennessy ZL2TBF, 108 Norton Rd, Hastings 4201
Branch Call-sign: ZL2AS
President: Mark Vidulich ZL2LAB
Secretary: Brain Fennessy ZL2TBF
Net Information: 3615 kHz on Sundays at 0900 and 147.250 Repeater
Contact Person: Mark Vidulich ZL2LAB
Contact Phone Number: (06) 844-2694 E-mail labman@clear.net.nz
Meeting Information: Fourth Wednesday each month (except December) at 1930 at Surf Lifesaving Rooms

14 Hawera Amateur Radio Club
Postal Address: 126 Fairfield Road, Hawera 4800
Branch Call-sign: ZL2AWW
Contact Person: Peter Williams ZL2AID
Contact Phone Number: (06) 278-4292
Meeting Information: Irregular

15 Central Hawkes Bay Radio Club
Physical Address: "Pukeroa" Home for Disabled
Postal Address: PO Box 327, Waipukurau 4176
Branch Call-sign: ZL2AR
Net Information: 3650 kHz at 2000
Contact Person: Victor Brosnan ZL2ACP
Contact Phone Number: (06) 857-7080
Meeting Information: Third Monday each month at 1930

16 Horowhenua
Physical Address: Jack Allen House, Durham Street, Levin
Postal Address: 19 Kent Street, Levin
Branch Call-sign: ZL2DS
President: Les Jury ZL4SS
Secretary: J.S. Burn (06) 368-8105
Net Information: 3590 kHz on Sundays at 0900. 147.575 on Sundays at 1000
Contact Person: Allen Little ZL2GB
Contact Phone Number: (06) 368-8484
Meeting Information: Last Sunday, odd months at Jack Allen House at 1400

17 Huntly Radio Club
Physical Address: Public Amenities Building, Huntly Domain
Postal Address: C/- R. M. Wahrlich, 39 Whangamarino Road, RD 2, Huntly 2152
Branch Call-sign: ZL1BL
President: Rohan Warlick ZL1CVK
Net Information: 146.5 simplex every Thursday at 1930
Contact Person: Rohan Warlich ZL1CVK
Contact Phone Number: (07) 826-3313
Meeting Information: Last Tuesday of each month at 1930

18 Hutt Valley
Physical Address: Birch Street Reserve, Waterloo
Postal Address: PO Box 30-519, Lower Hutt 6315
Branch Call-sign: ZL2HV
President: Bruce Douglas ZL2WP
Net Information: 3675 kHz on Sundays at 0900
Contact Person: Bruce Douglas
Contact Phone Number: (04) 589-1802
Meeting Information: First Monday each month at 1930. Also every Friday at 1930 (informal)

19 Inglewood
Postal Address: 1778 Mountain Road, RD10, Inglewood 4651
President: Peter Cramer ZL2AIS
Secretary: Tarry Martin ZL2KV
Contact Person: Peter Cramer ZL2AIS
Contact Phone Number: (06) 756-7314

20 Manawatu Amateur Radio Society
Physical Address: Totara Road, Palmerston North 5301
Postal Address: PO Box 1718, Palmerston North 5321
Branch Call-sign: ZL2KO
President: B. W. Priest ZL2BOB
Secretary: Eric J. Barker ZL2AAG
Net Information: 3570 kHz on Sundays at 0930. 147.125 kHz on Thursdays at 2000
Contact Person: Eric Barker ZL2AAG
Contact Phone Number: (06) 358-9670
Meeting Information: First Wednesday each month at 1930, fourth Wednesday 1400 for "Old Timers", fifth Wednesday 1930 social "natta session", third Wednesday at 1930 committee meeting
Additional information: first Friday each month 2000 hours on 999 kHz for those interested in "Radio" a programme for the Amateur. This is repeated the following Tuesday by Print Disabled at 0800 hours on 1602 kHz and 3935 kHz

21 Manukau Radio Club
Physical Address: 8 Guide Place, Papatoetoe
Postal Address: 8 Guide Place, Papatoetoe 1701
Branch Call-sign: ZL1QB
President: Ron Sykes ZL1AHO
Secretary: Gerry Welford ZL1AWW
Net Information: 3652 kHz on Sundays at 0900. 146.550 on Mondays at 1930
Contact Person: Gerry Welford ZL1AWW
Contact Phone Number: (09) 266-3169 or (09) 277-6426 E-mail zl1aww@xtra.co.nz
Meeting Information: Third Wednesday each month at 1930. Committee first Wednesday at 1930

22 Marlborough Amateur Radio Club
Physical Address: CD Headquarters, Withers Road extension (West) Blenheim
Postal Address: PO Box 432, Blenheim 7315
Branch Call-sign: ZL2KS
President: Ian Conway ZL2BGL
Secretary: Helen Harris ZL2TPT
Net Information: 3575 kHz on Sundays at 0900. Blenheim 146.695 on Mondays at 1930
Contact Person: Helen Harris
Contact Phone Number: (03) 575-7181
Meeting Information: Second Thursday each month, at 1930 at the CDHQ. Social Group third
Thursday each month 1400 hours at CDHQ

23 Marton & Districts
Physical Address: Marton CDHQ Rooms (back of Public Library Building, High Street, Marton
Postal Address: PO Box 279, Marton 5460
Branch Call-sign: ZL2AMS
President: Brian Purdie ZL2TPS
Secretary: Fred Rubery ZL2NR
Net Information: 6775 on Sundays at 2000
Contact Person: Dusty Miller ZL2VS
Contact Phone Number: (06) 327-6225
E-mail: rubery@voyager.co.nz
Meeting Information: Fourth Wednesday each month at 1930 at Marton CDHQ

24 Motueka
Postal Address: PO Box 218, Motueka 7161
Branch Call-sign: ZL2GK
President: Stephen Fogerty ZL2ASF
Secretary: Graham M. Hunter ZL2USB
Net Information: 146.670 MHz on Sundays at 1945-2100
Contact Person: Graham M. Hunter ZL2USB
Contact Phone Number: (026) 352-5219
Meeting Information: First Monday each month (except Public holidays) at 1930

25 Napier Amateur Radio Club
Physical Address: 123 Latham Street, Marewa, Napier 4001
Postal Address: 3 Forsyth Street, Taradale, Napier
Branch Call-sign: ZL2GT and ZL2ABJ
President: Gordon C. Frazer ZL2NF
Secretary: Colin Lee ZL2WCL
Net Information: 3615 kHz and Napier 725 on Sundays at 0900
Contact Person: Gordon C. Frazer ZL2NF
Contact Phone Number: (06) 844-2367
Meeting Information: Third Sunday each month at 1930

26 Nelson Amateur Radio Club
Postal Address: PO Box 414, Nelson 7015
Branch Call-sign: ZL2ARG
President: David Holland ZL3TPV
Secretary: Stan Barnes ZL2JSB
Net Information: 3890 kHz on Sundays at 0900
Contact Person: David Holland ZL3TPV
Contact Phone Number: (03) 548-5414
Meeting Information: Fourth Wednesday each month (except December and January) at 1930

27 New Plymouth Amateur Radio Club
Physical Address: CDHQ Marsland Hill
Postal Address: C/- CDHQ, 45 Robe Street, New Plymouth 4601
Branch Call-sign: ZL2AB
President: Frank Hunt ZL2BR
Secretary: Brian Lawn ZL2AJS
Net Information: Wednesday at 2000 on 720. AM net on Wednesday at 2030 on 3850 kHz and HF net on Thursday at 2000 on 3593 kHz
Contact Person: Brian Lawn ZL2AJS
Contact Phone Number: (06) 753-5655
E-mail: blawn@xtra.co.nz
Meeting Information: Third Tuesday each month (except January) at 1930

28 Whangarei Amateur Radio Club.
Physical Address: Heritage Park, Maunu, Whangarei
Postal Address: PO Box 10-078, Te Mai, Whangarei
Branch Call-sign: ZL1AM
President: Paul Slako ZL1PF
Secretary: Charlie Moates ZL1DAC
Net Information: 3585 kHz on Sundays at 0900. Whangarei 720 on Mondays at 1930. 3580 kHz (CW) Tuesdays at 1930
Contact Person: Charles Moates ZL1DAC
Contact Phone Number: (09) 434-7292
Meeting Information: First Wednesday each month at 1930. Informal gatherings at the clubroom every Wednesday at 1700

29 North Shore
Physical Address: CD HQ, 400 East Coast Road, Mairangi Bay, North Shore
Postal Address: North Shore Branch NZART, 400 East Coast Road, Mairangi Bay North Shore 1310
Branch Call-sign: ZL1AB
President: Arthur Godfrey ZL1HV
Secretary: Alan Wooller ZL1AUW
Net Information: 3775 kHz (LSB) on Sundays at 0900. 147.425 (FM) on Wednesdays at 1930
Contact Person: Norman Nobbs ZL1FON
Contact Phone Number: (09) 445-8638 E-mail alenw@kcbbs.gen.nz
Meeting Information: First Monday each month (except June—second Monday) at 1930 (General), AREC second Monday at 1930, Committee third Monday at 1930, AGM first Monday in November at 1930

30 Otago
Physical Address: 109 Macandrew Road, Dunedin
Postal Address: PO Box 5485, Dunedin 9015
Branch Call-sign: ZL4AA
President: Alan Cross
Secretary: Alan Rackley ZL4CG
Net Information: Dunedin 690 on Sundays at 1930
Contact Person: Alan Gilchrist ZL4PZ
Contact Phone Number: (03) 488-0608
Meeting Information: Each Wednesday (except late December and early January) at 1930

31 Pahiatua
In Recess refer to Branch 06

32 Rahotu Coastal Inc Opunake Radio Club
Physical Address: 166 Tasman Street
Postal Address: 166 Tasman Street, Opunake 4854
Branch Call-sign: ZL2ANN
President: Peter McNeil ZL2BQW
Secretary: J. N. Jago ZL2DBX
Contact Person: H. Gorton ZL2ADU
Contact Phone Number: (06) 761-7027
Meeting Information: As required

33 Rotorua Amateur Radio Club
Physical Address: Wohlmann House, 1029 Hinemoa Street, Rotorua
Postal Address: Wohlmann House, 1029 Hinemoa Street, Rotorua
Branch Call-sign: ZL1ROT
President: Stewart Dines ZL1UTX
Secretary: Ted Bretherton ZL1MG
Net Information: Rotorua 735 on Fridays at 2030
Contact Person: Murray Parkinson ZL1BHW
Contact Phone Number: (07) 348-4561 E-mail mparkinson@clear.net.nz
Meeting Information: Third Tuesday each month at 1930. Informal, first Tuesday each month at 1930

34 South Canterbury
Physical Address: CD HQ, Bank Street, Timaru
Postal Address: PO Box 429, Timaru 8615
Branch Call-sign: ZL3UR
President: Brian McDonald ZL3HF
Secretary: Rex Firman ZL3DY
Net Information: Timaru 695 on Sundays at 1930
Contact Person: Brian McDonald ZL3HF
Contact Phone Number: (03) 686-1157 E-mail electric@es.co.nz
Meeting Information: Last Monday of each month (except December) at 1930

35 Balclutha
Physical Address: Main South Road
Postal Address: "Graylea", RD 2, Balclutha 9200
Branch Call-sign: ZL4JF
Net Information: 3585 kHz on Mondays at 2000. Kuriwao 675 on Mondays at 1930
Contact Person: Philip Beeby ZL4TCU
Contact Phone Number: (03) 418-2337
Meeting Information: First Tuesday each month (except January) at 2000

36 South Westland
Postal Address: 7 Whitcombe Terrace, Hokitika 7900
Contact Person: Dave Robinson ZL3GW
Contact Phone Number: (03) 755-6741
Meeting Information: Irregular

37 Southland
Physical Address: 249 Ettrick Street, Invercargill
Postal Address: P.O. Box 1260, Invercargill 9515
Branch Call-sign: ZL4GQ
President: Crosbie Stewart ZL4TIC
Secretary: John Willoughby ZL4FV
Contact Person: Crosbie Stewarrt ZL4TIC
Contact Phone Number: (03) 216-3060
Meeting Information: Second Tuesday of each month, (except January) at 1930. AREC second Tuesday

38 Taumarunui
Postal Address: C/- T. R. Hardisty, 293 Taupo Road, Taumarunui 2600
President: L. Palmer
Secretary: T. Hardisty
Contact Person: Trevor Hardisty
Contact Phone Number: (07) 895-7994
Meeting Information: As required

39 Tauranga Amateur Radio Club
Physical Address: CDHQ, Cameron Road South, Tauranga
Postal Address: C/- CD HQ, Private Bag 12803, Tauranga 3030
Branch Call-sign: ZL1TP
President: Derek Stansfield ZL1CYK
Secretary: Bill Richardson (acting) ZL1APD
Net Information: 3600 kHz on Sundays at 0900. 438.8500 on Tuesdays at 0900 and 1930. On Wednesdays 146.800 at 2030 hours
Contact Person: John Collin ZL1BNW
Contact Phone Number: (07) 578-9213
Meeting Information: First Thursday each month except January at 1930

40 Te Awamutu Amateur Radio Club
Physical Address: Waipa District Council Building, Bank Street, Te Awamutu 2400
Postal Address: PO Box 583, Te Awamutu 2400
Branch Call-sign: ZL1CB
President: Bernard Westerbaan ZL1WWW
Secretary: Ewen Parsons ZL1LP
Net Information: 3865 kHz on Thursdays at 1900. 147.525 on Sundays at 2000
Contact Person: Ewen Parsons ZL1LP
Contact Phone Number: (07) 871-5487 or 871-7039 E-mail ewenrp@xtra.co.nz
Meeting Information: Fourth Wednesday each month at 1945

41 Thames
Postal Address: 503 Sealey Street, Thames 2801
Branch Call-sign: ZL1DF
President: Peter Williams ZL1BEB
Secretary: Bruce Steel ZL1AAO
Net Information: 3850kHz LSB & 145.700 FM on Sundays at 0900
Contact Person: Lea Bateman ZL1ABF
Contact Phone Number: (07) 868-5242
Meeting Information: February, May, August and November. Venue announced via Branch newsletter and on the Branch net

42 Titahi Bay Amateur Radio Club
Physical Address: Tireti Hall, Tireti Road, Titahi Bay
Postal Address: PO Box 57-028, Mana, Wellington 6006
Branch Call-sign: ZL2AFV
President: Colin Hopkins ZL2TPX
Secretary: Mike Burch ZL2AUA
Net Information: 3710kHz on Sundays at 2000
Contact Person: Ron Blackwood ZL2OY
Contact Phone Number: (04) 232-5587
Meeting Information: First Tuesday each month (except January) at 1930

43 Waihi & Districts
Physical Address: Williams Street, Waihi
Postal Address: C/- Secretary, 32 Gilmour St. Waihi 0298
Branch Call-sign: ZL1QW
President: Ron Boggiss ZL1RB
Secretary: Anne Anderson ZL1TAF
Contact Person: Anne Anderson ZL1TAF
Contact Phone Number: (07) 863-7546 E-mail zl1taf@xtra.co.nz
Meeting Information: First Wednesday each month (except January) at 1930. Ring Secretary for location

44 Matamata Radio Club
Physical Address: Staff Room Matamata District Council. Tainui Street, Matamata
Postal Address: 74 Tawari Street, Matamata 2271
Branch Call-sign: ZL1RF
President: John Rasmussen ZL1AGA
Secretary: Ian Perkins ZL1BFH
Net Information: 3560 kHz on Sundays at 0900
Contact Person: John Rasmussen ZL1AGA
Contact Phone Number: (07) 888-8269
Meeting Information: Second Wednesday each month at 1930

45 Waimarino
Postal Address: C/- J. Vernon, 1 Whio Street, Taihape
Branch Call-sign: ZL2MG
President: T. L. Garmonsway ZL2AMT
Secretary: J. Vernon ZL2BHX
Contact Person: J. Vernon ZL2BHX
Contact Phone Number: (06) 388-1855
Meeting Information: Irregular. Contact Secretary

46 Wairarapa Amateur Radio Club (Inc)
Physical Address: Hood Aerodrome, Manaia Road, Masterton
Postal Address: PO Box 860, Masterton 5900
Branch Call-sign: ZL2OA
President: Paul London ZL2BEF
Secretary: Dan Rodda ZL2BDK
Net Information: Masterton 680 on Mondays at 2000 except meeting nights & January
Contact Person: Dan Rodda ZL2BDK
Contact Phone Number: (06) 377-1671
Meeting Information: Second Monday each month (except January) at 1930

47 Waitara Amateur Radio Club
Physical Address: Manukorihi Park Sports Club, Manukorihi Road, Waitara
Postal Address: 48 Leslie Street, Waitara Taranaki. 4656
Branch Call-sign: ZL2TO
President: Ian Cash ZL2BRA
Secretary: Larry Smart ZL2SM.
Net Information: 3666 kHz on Tuesdays at 2000
Contact Person: Ian Cash ZL2BRA
Contact Phone Number: (06) 754-6183
E-mail zl2sm.smart@xtra.co.nz
Meeting Information: First Sunday each month (except January) at 1930

48 Wanganui Amateur Radio Society Inc.
Physical Address: Stalkers and Hunters Hall, Peat Street, Wanganui
Postal Address: C/- 1 Caversham Rd, Wanganui 5001
Branch Call-sign: ZL2JA
President: Mike Newman ZL1BNB
Secretary: Jeff Howe ZL2THO
Net Information: Each Tuesday 2000 on 146.900 (Wanganui 690)
BBS: 144.600 ZL2JA
Contact Person: Jeff Howe ZL2THO
Contact Phone Number: (06) 344-4302
Meeting Information: First non-public holiday Monday each month (except January), at 1930

49 Westland
Postal Address: 15 Geraldine Street, Greymouth
Branch Call-sign: ZL3GY
President: Bob McQuarrie ZL3TY
Secretary: D. Shea ZL4CP
Net Information: Westland 695 as contact for club members
Contact Person: Frank Simpson ZL3FMS
Contact Phone Number: (03) 762-6541
Meeting Information: First Wednesday each month (except January) at 1930
Meeting held at Electronet Services, Tainui St. Building, Greymouth

50 Wellington Amateur Radio Club
Physical Address: WEMO HQ, Murphy Street, Thorndon, Wellington
Postal Address: PO Box 6464, Marion Square, Wellington 6035
Branch Call-sign: ZL2WB
President: Mike Kerr ZL2BCW
Secretary: Tony Fletcher ZL2ALJ
Net Information: 3620 kHz on Sundays at 0930. 146.575 monitored on Sundays
Contact Person: Tony Fletcher ZL2ALJ
Contact Phone Number: (04) 383-8838 E-mail zl2alj@paradise.net.nz
Meeting Information: Third Tuesday each month (except December) at 1930

51 Eastern Bay of Plenty
Physical Address: Waiewe Street, Hillcrest, Whakatane
Postal Address: PO Box 2165, Kopeopeo, Whakatane 3080
Branch Call-sign: ZL1AIU
President:
Secretary: Donal Reid ZL1AIF
Net Information: 3722KHz on Mondays at 1930
Contact Person: Alan McDonald ZL1PI
Contact Phone Number: (07) 308-7740 E-mail donal@wave.co.nz
Meeting Information: Second Wednesday each month except January, at 1800—business at 1730

52 Northern Hawkes Bay

53 Te Puke Amateur Radio Club
Physical Address: State Highway 2, Te Puke Holiday Park
Postal Address: PO Box 386, Te Puke 3070
Branch Call-sign: ZL1IB
President: Bernie Rickard ZL1BAZ
Secretary/Treasurer: Brion Bott ZL1CAG
Net Information: Tauranga 680 on Wednesdays at 2030. 3600 kHz at 0900 on Sundays
438.855 Repeater at 0900 & 1930 on Tuesdays
Contact Person: Bernie Rickard ZL1BAZ
Contact Phone Number: (07) 573-9856
Meeting Information: Second Saturday each month at 1330, also Practical Day each Saturday at 1300 at the clubrooms

54 Patea
Postal Address: PO Box 156, Patea 4800
Branch Call-sign: ZL2QF
President: Robin Clarkson ZL2AFE
Secretary: David Robinson ZL2BJI
Net Information: A call on Egmont 705 will get a response
Contact Person: David Robinson ZL2BJI
Contact Phone Number: (06) 278-7486
Meeting Information: Third Monday each month at 1945 at Salvation Army Lounge

55 Waitomo Radio Club
Physical Address: Thomson Avenue, Otorohanga
Postal Address: 15 Frederick Street, Otorohanga 2564
Branch Call-sign: ZL1IZ
President: Brian Aspinall ZL1VCR
Secretary: Ihian Howitt ZL1BZ
Net Information: 3850 kHz on Mondays at 2000. Waitomo 7375 on Sundays at 0900
Contact Person: Ihian Howitt ZL1BZ
Contact Phone Number: (07) 873-7349 E-mail bjaspinall@xtra.co.nz
Meeting Information: First Tuesday each month (except January) at 1930. Venue may change but mostly at Clubrooms

56 Christchurch West Amateur Radio Club
Physical Address: Auburn Park, Upper Riccarton
Postal Address: C/- PO Box 31-095, Ilam, Christchurch 8030
Branch Call-sign: ZL3VV
President: Baden Melhuish ZL3VI
Secretary: John Walker ZL3IB
Net Information: Each Sunday at 2000 on 147.050
Contact Person: Des Borgfeldt ZL3ACS
Contact Phone Number: (03) 349-9705 E-mail borgfeldt@xtra.co.nz
Meeting Information: Fourth Tuesday each month at 1930. "Free n Easy" second Wednesday each month at 1330. "Technology Evening" second Tuesday each month at 1930

57 Tokoroa
Physical Address: Ireland Reserve, Baird Road
Postal Address: Ireland Reserve, Baird Road, Tokoroa 2392
Branch Call-sign: ZL1AQR
President: Roger Simmonds ZL1UTW
Secretary: Erwin Penwarden ZL1TDV
Contact Person: Erwin Penwarden ZL1TDV
Contact Phone Number: (07) 886-7675
Meeting Information: Third Monday each month (except December and January) at 1930

58 Helensville
In Recess

59 Mangakino
In Recess

60 Taupo
Physical Address: AC Reserve, AC Baths Avenue
Postal Address: C/- 40 Oregon Drive, Taupo 2730
Branch Call-sign: ZL1BCO
President: Graeme Frederick ZL1BU
Secretary: Ray Morrison ZL2JE
Net Information: Taupo 675 on Mondays at 1930
Contact Person: Graeme Frederick ZL1BU
Contact Phone Number: (07) 378-0553
Meeting Information: First Thursday each month at 1930

61 Central Otago
Physical Address: Alexandra Fire Station, Centennial Avenue
Postal Address: C/- 145 Tarbent St, Alexandra 9181
Branch Call-sign: ZL4OO
President: Peter Leigh ZL2APO
Secretary: Murray McCutcheon ZL4GP
Net information: 3.660 on Tuesday Nights at 2000 hours
Contact Person: Russell Baird ZL4DJ
Contact Phone Number: (03) 448-9363
Meeting Information: Fourth Thursday each month (except December) at 2000

62 Reefton-Buller
Physical Address: 61 Wakefield Street
Postal Address: C/- 42 Domett Street, Westport 7601
Branch Call-sign: ZL3BRC
President: Carole Stephens ZL3VAS
Secretary: Kim McLaughlin ZL3WPT
Net Information: 3880 kHz on Sundays at 2000
Contact Person: Payl McLaughlin ZL3VC
Contact Phone Number: (03) 789-6942
Meeting Information: First Tuesday each second month (except January) at 1930 at 61 Wakefield Street, Westport

63 Upper Hutt
Physical Address: City Council Yard, Park Street, Upper Hutt
Postal Address: PO Box 40, Upper Hutt 6415
Branch Call-sign: ZL2VH
President: Peter Kidd ZL2BIR
Secretary: Joe Reed ZL2AH
Net Information: Climie 730 anytime
Contact Person: N. M. Gibbons ZL2TNG.
Contact Phone Number: (04) 528-4558 (work)
Meeting Information: Every Friday night at 1930

64 Oamaru ARC
Physical Address: CD Headquarters, Severn Street
Postal Address: 9 Worcester Street, Hampden 8950
Branch Call-sign: ZL4OU
President: Alan Naish ZL4RB
Secretary: George Rolton ZL4SEA
Net Information: Oamaru 670 on first Monday at 1930
Contact Person: Doug Walker ZL4TDF
Contact Phone Number: (03) 437-1262
Meeting Information: Second Monday each month (except January) at 1930

65 Papakura Radio Club
Physical Address: Wellington Park, 1R Great South Road, Papakura
Postal Address: PO Box 397, Papakura 1703
Branch Call-sign: ZL1VK
President: John Balsillie ZL1ALZ E-mail gibit@xtra.co.nz
Secretary: Mark Foster ZL1VMF
Morse Administrator: Dave Johnston ZL1AMN
Morse Testers: John Balsillie ZL1ALZ and Geoff Reed ZL1AKY
Net Information: 3755 on Sundays at 0900. 147.325 on Sundays at 0830
Contact Person: John Balsillie
Contact Phone Number: John Balsillie (09) 233-6182 or 025 948-818
Meeting Information: General Meeting first Wednesday each month at 1930. Day meeting fourth Wednesday at 1330. Projects evening second Wednesday. Indoor bowls third Wednesday. Committee fourth Wednesday. AREC any fifth Wednesday

66 Auckland VHF Group
Physical Address: End of Hazel Avenue (off Dominion Road), Mount Roskill
Postal Address: PO Box 10-138, Auckland 1030
Branch Call-sign: ZL1BQ
President: Bill Burman ZL1TTH
Secretary: Jim Meachen ZL2BHF
Net Information: Klondyke Repeater 146.625 every Sunday at 2000
Contact Person: Jim Meacham ZL2BHF
Contact Phone Number: (09) 480-1043 or 025 531022 E-mail jim.m@clear.net.nz
Meeting Information: Third Monday each month at 1930. Committee last Monday each month at 1930

67 Kawerau Amateur Radio & Hobbies Club
Physical Address: Meetings held in members homes, confirm venue with Secretary
Postal Address: 34 Cobham Drive, Kawerau 3083
Branch Call-sign: ZL1KW
President: Barry Liddle ZL1CAY
Secretary: Bev Osborne ZL1OS
Contact Person: Graeme Osborne ZL1ALG
Contact Phone Number: (07) 323-7515 E-mail osborneg@wave.co.nz
Meeting Information: Third Tuesday each month at 1930 except December and January. Meeting date and time changes occasionally to suit attending members

68 North Canterbury Amateur Radio Club
Physical Address: Woodend Youth Centre, Rangiora-Woodend Road, Woodend
Postal Address: C/- PO Box 14, Woodend 8255
Branch Call-sign: ZL3RR
President: Ann Fraser ZL3TNT
Secretary: Colin G. Rowe ZL3COL
Net Information: 3605 kHz on Monday before regular club meeting at 2030, also 6975 repeater on Sundays at 1900
Contact Person: Colin G. Rowe ZL3COL
Contact Phone Number: (03) 313-2303
E-mail: colingr@xtra.co.nz
Meeting Information: Second Thursday of each month (except January) at 1930.

69 Kapiti
Physical Address: Corner Aorangi Road and Tutanekai Street
Postal Address: PO Box 166, Paraparaumu 6450
Branch Call-sign: ZL2KB
President: Bill Cox ZL2BIL
Secretary: Dennis Young ZL2BFI
Net Information: Kapiti 685 on Sundays at 2000
Contact Person: Dennis Young ZL2BFI
Contact Phone Number: (04) 902-1773
Meeting Information: First Wednesday each month at 2000, and third Wednesday each month at 1400. Club room open Saturdays 0930–1200

70 Feilding Radio Club
Postal Address: 19 Campbell Street, Feilding 5600
Branch Call-sign: ZL2AMR
President: John Poulsen ZL2TCA
Secretary: Mike Prior
Contact Person: Paul Harris ZL2WOG
Contact Phone Number: (06) 323-5524
Meeting Information: Second Monday each month in ATC rooms Chamberlain Street

71 Rodney Amateur Radio Club
Physical Address: Warkworth Scout Den, Shoesmith Street, Warkworth
Postal Address: PO Box 587 Warkworth 1241
Branch Call-sign: ZL1ROD
President: Jim Goodsir ZL1BJI
Secretary: Irving Spackman ZL1MO
Net Information: 147.300 on Thursdays at 1930
Contact Person: Irving Spackman ZL1MO QTH as per *Call Book*
Contact Phone Number: (09) 626-4886 with Answerphone.
E-mail ispackman@xtra.co.nz
Meeting Information: Third Thursday each month except December at 1930 in Scout Den as above

72 Opotiki Amateur Radio Club
Physical Address: King Street, above State Ins Office, Opotiki
Postal Address: C/- P.O. Box 383, Opotiki 3092
Branch Call-sign: ZL1BY
President: Bill Jackson ZL1UWH
Secretary: Bill West ZL1WJW
Contact Person: Steve Winder ZL1ACE
Contact Phone Number: (07) 315-7333
Meeting Information: First Monday each month (except holiday weekends & January) then held on 2nd Monday at 1900

73 Northern Wairoa Electronics Club

74 Wellington VHF Group
Physical Address: Hutt Theatre School Hall, Birch Street, Lower Hutt
Postal Address: PO Box 12 -259, Thorndon, Wellington
Branch Call-sign: ZL2WA
President: Doug Ingham ZL2TAR
Secretary: Peter Cobb ZL3TCE
Net Information: 147.100 MHz continuous
Contact Person: Cliff Walker ZL2ALY
Contact Phone Number: (04) 904-8991 E-mail zl2wa@clear.net.nz
Meeting Information: Last Thursday each month (except December) at 1930

75 Queenstown
Postal Address: PO Box 66, Wakitipu, Queenstown 9195
Branch Call-sign: ZL4NQ
Secretary: Dave Allison
Contact Person: Russ Watson
Contact Phone Number: (03) 442-9374

76 Kaikoura Radio Club
Postal Address: 42 Churchill Street, Kaikoura 8280
President: H. G. H. Bryant ZL3GB
Secretary: R. J. Godfrey ZL3DR
Net Information: Kaikoura 690 on Saturdays at 1930
Contact Person: Bill Jackson ZL3PZ
Contact Phone Number: (03) 319-5981, Fax: (03) 319-7081
Meeting Information: As required

77 Te Aroha & Districts Radio Club Inc
Physical Address: Civil Defence HQ, Rewi Street, Te Aroha
Postal Address: 12 Emerson Street, Te Aroha 2971
Branch Call-sign: ZL1BSM
President: Brian McConnochie ZL1BWK
Secretary: Morris Beale ZL1ANF
Contact Person: Brian McConnochie ZL1BWK
Contact Phone Number: (07) 884-8189 (Wk) (07) 884-8871 (Hm)
Meeting Information: Third Tuesday in February (AGM), April, July and October at 2000

78 Far North Districts Amateur Radio Club Inc.
Postal Address: PO Box 4, Awanui, Far North 0552
Branch Call-sign: ZL1FND
President: Bob Evans ZL1OT
Secretary: Eric Manning ZL1GE
E-mail: eric.man@xtra.co.nz
Net Information: 147.100 on Mondays at 2000.
Contact Person: Eric Manning ZL1GE ZL1GE
Contact Phone Number: (09) 408-7059
Meeting Information: Listen to Branch net for details

79 Howick & Districts Radio Club (Inc)
Physical Address: Keall House 31 Uxbridge Road, Howick
Postal Address: C/- 116 Union Rd, Howick, Auckland 1705
Branch Call-sign: ZL1TB
President: Alan Scott ZL1AAS
Secretary: Vern Morris ZL1TDG
Net Information: 3820 kHz LSB and 146.575 FM on Sundays at 0900
Contact Person: Vern Morris ZL1TDG
Contact Phone Number: (09) 534-2892
Meeting Information: First Wednesday each month (except January) at 1930

80 Hibiscus Coast Amateur Radio Club
Physical Address: 479/1 Whangaparoa Road
Postal Address: 479/1 Whangaparoa Road, Whangaparoa 1463
Branch Call-sign: ZL1FU
President: Iain Kelly ZL1IK
Secretary: John Bell ZL1FB
Net Information: 3620 kHz on Sundays at 0830. 147.075 on Thursdays 1930 NZST
Contact Person: Eric Mancer ZL1BDO
Contact Phone Number: (09) 424-8083
Meeting Information: Third Thursday each month at 1930 (except December, AGM second Monday)

81 Waikato VHF Group
Postal Address: P.O. Box 606, Hamilton 2015
Branch Call-sign: ZL1IS
President: Noel Rowe ZL3GR
Secretary: Gavin Petrie ZL1UAB
Net Information: Waikato 695 on Sundays at 2030
Contact Person: Gavin Petrie ZL1UAB
Contact Phone Number: (07) 843-0326
Meeting Information: February, May, August and November, last Sunday at 1330 Listen to net for details

82 Southern Wairarapa Amateur Radio Club
Physical Address: St. John Building, Lyon Street, Featherston 5952
Postal Address: C/- 21 Hardie Grove, Featherston 5952
Branch Call-sign: ZL2BPP
President: Bob Pearce ZL2GJ (06) 306-9798
Secretary: Pauline Carr ZL2QW (06) 308-9576
Net Information: Continuously on Southern Wairarapa 715
Contact Person: Bob Pearce ZL2GJ
Contact Phone Number: (06) 306-9798
Meeting Information: First Sunday each month (except January, July and August) at 1930

83 Raglan Amateur Radio Club
Physical Address: 25 Bay View Road
Postal Address: 25 Bay View Road, Raglan 2051
Branch Call-sign: ZL1CCT
President: Jack Sanders ZL1AUV
Secretary: Fred Gilbert ZL1FG
Net Information: 3625 kHz on Saturdays at 0830.
Contact Person: Fred Gilbert ZL1FG
Contact Phone Number: (07) 825-8018 E-mail fgilbert@voyager.co.nz
Meeting Information: Informal as required

84 Bay of Islands Amateur Radio Club
Physical Address: Citizens Advice Bureau, Cobham Road, Kerikeri
Postal Address: Secretary, 28 Butler Road, Kerikeri 0470
Branch Call-sign: ZL1BOI
President: Ian Wilson ZL1CBD
Secretary: Mike Thompson ZL1BWV
Net Information: 146.750 on Wednesday at 2000
Contact Person: Ian Wilson
Contact Phone Number: (09) 407-8901 (home) or (09) 407-4149 (work)
Meeting Information: Second Wednesday every two months at 1930

85 Mercury Bay
Physical Address: Mercury Bay Community Board Rooms
Postal Address: 39 Cook Drive, Whitianga 2856
Branch Call-sign: ZL1MBB
President: Tom Glendinning ZL1AMZ (07) 866-2346
Secretary: Graham Mantell ZL3CN (07) 866-2443
Contact Person: Graham Mantell ZL3CN
Contact Phone Number: (07) 866-2443
Meeting Information: Second Wednesday each month at 1900

86 Suburban Amateur Radio Club Inc.
Physical address: Musick Memorial Radio Station, Musick Point, Bucklands Beach, Auckland
Postal address: C/- 51 Caronia Crescent, Lynfield, Auckland
Branch Call-sign: ZL1ZLD, Museum Group ZL1ZLF, South Auckland Repeater Group ZL1HK
President: Ian Walker ZL1BFB (09) 626-7188
Secretary: Ann Walker ZL1TRH (09) 626-7188
Contact Person: Ann Walker ZL1TRH and N. Walker ZL1BFB
Contact Phone Number: Telephone/Fax (09) 626-7188
Meetings: General/Social, second Sunday each month 1400, Musick Memorial Radio Station (telephone Secretary for venue details)

Affiliated Branches
Canterbury Amateur Radio Development Society Inc.
Postal address: PO Box 21-188, Edgeware, Christchurch 8030
Branch Call-sign: ZL3CAR
President: Mike Stubberfield ZL3MJS
Secretary: Lorna Allan ZL3AAZ
Net Information: As required
Contact person: Mike Stubberfield ZL3MJS
Contact Phone Number: (03) 313-5352
Meetings: General, periodically as required. AGM June each year

New Zealand Amateur Radio Milestones

compiled by
IAN DOUGHERTY
NZART Historian

1888 George Kemp attempts wireless experiments in Gisborne.

1899 John Cooper demonstrates wireless telegraphy at Canterbury University.

1902 James Logan sends Morse code messages across Wellington Harbour. W. P. Huggins in Timaru and Joe Passmore in Dunedin also send messages short distances.

1903 Establishing amateur stations without permission outlawed.

1908 Amateur stations in Dunedin send first official wireless message between land-based stations.

1909 Amateurs operating illegally interfere with naval communications.

1911 Outside aerials banned.

1912 First reported use of amateur radio in an emergency when ship rescued at entrance to Wellington Harbour after amateurs, operating illegally, pick up distress call.

1914 All amateur activity banned. Amateurs continue to operate illegally.

1921 Provisional permits issued for amateur stations.

1922 November 5, Ralph Slade in Timaru first New Zealand amateur to receive US amateurs.

Wireless telephony used for first time.

1923 January 18, regulations gazetted for licensing of amateur, experimental and broadcasting stations. Annual amateur licence fee for Grade One operators £2. Grade Two operators £1. Examination fee for operator's certificate five shillings. Morse tests 10 and 8 wpm. Minimum age 14. Wavelengths 140–180 m. Maximum power 50 W.

April 26, first trans-Tasman contact, between Frank Bell (using call-sign BELL) at Shag Valley in Otago and Charlie Maclurcan 2CM in Sydney.

June 8, Dan Wilkinson 2AB in Motueka first licensed amateur. Forty licences issued by end of year.

1924 New Zealand allocated call-sign prefix Z.

May 22, Ivan O'Meara Z2AC in Gisborne and Carlos Braggio RCB8 in Buenos Aires make first New Zealand-South America contact and set world distance record for two-way radio communication.

Further world records set by Ivan O'Meara Z2AC in Gisborne and Jack Orbell Z3AA on ship off South American east coast.

September 21, Frank Bell Z4AA at Shag Valley and Wallace Magner 6BCP in San Pedro make first New Zealand-North America contact and set new world record.

October 18, first round-the-world two-way radio contact, between Frank Bell Z4AA at Shag Valley and Cecil Goyder G2SZ in London.

1925 Single licence replaces previous two grades. Standard Morse test 10 wpm. Wavelengths 120–160 m. Maximum power 100 W.

Frank Bell Z4AA elected to International Amateur Radio Union executive at founding meeting in Paris.

1926 August 16, New Zealand Association of Radio Transmitters formed in Auckland. Annual subscription five shillings.

Brenda Bell first YL operator.

Joe Johnson Z2GA first portable transmitter/receiver licence.

Gordon Smithson Z1AF makes first NZART Official Broadcast.

1927 International Telecommunications Union establishes Internationally-agreed frequency bands.

New Zealand allocated prefix OZ.

Sangster Shield Contest starts.

1928 First issue of *Break-In* published, and provided free to NZART members.

First crystal controlled transmitter built and operated by Gordon Brown OZ4AE and Arnold Grubb OZ4AL.

September 23, first overseas 10 m contact, between Hilton Arthur OZ1AN in Auckland and OA3CP in Melbourne.

1929 NZART admitted to IARU.

Harmonically related bands come into use.

New Zealand allocated prefixes ZK-ZM. Opts for ZL for mainland stations.

QSL Bureau established.

1930 World record 10 m contact between Norm Edwards ZL1AA in Auckland and F8AW in France.

Myrt Earland ZL3AG first licensed YL operator.

1931 Amateurs provide vital communications during Hawkes Bay earthquake.

1932 Morse test increased to 12 wpm. All amateurs allowed to use 160 and 80 m. Higher frequency bands opened up to those with higher degree of skill.

Radio Emergency Corps formed and first National Field Day held.

1934 First contact between aircraft and ground station established by Casey Harris ZL4CA and Ray McConnell ZL4BV in Otago.

1935 First NZART *Call Book* published.

Canterbury amateurs attempt first E-M-E.

Norm Laugesen ZL3AS first NZART Honorary Life Member.

1936 Number of amateurs reaches 1000.

1938 Dave Brown ZL1HY first ZL awarded DXCC.

1939 Amateur radio banned for duration of World War II. Amateurs serve as wartime radio operators. Amateur gear used in war effort.

1945 December 8, 7.30 pm, "H Night". Wartime ban on amateur radio lifted. Operations restricted to domestic contracts on parts of 80 and 5 m bands.

Morse test increased to 15 wpm for HF permit holders.

1946 Further pre-war bands released and overseas contracts resume.

50 to 54 MHz made available.

NZART *Call Book* published as free supplement to *Break-In*.

Memorial Contest starts.

ZC1 army surplus transmitters sold for £20.

1948 First 2400 MHz contract, between Bill Collett ZL4BP and Jeff Walker ZL4DH.

Worked All Pacific and Worked All Branches Awards introduced.

1949 Maori language allowed on air as plain language in addition to English.

REC re-named Amateur Radio Emergency Corps.

144 to 148 MHz made available.

World record 50 MHz contact between Maurice Wills ZL4GY and K6BF.

1951 World record 144 MHz contact between Dave Buchanan ZL3AR and VK2AH.

1952 National Field Day and Frequency Measuring Contests start.

21 to 21.45 MHz made available.

First SSB contact, between Jack Mason ZL1QS and Maurie Walker ZL1AU.

1953 May 31, Old Timers' Club formed in Palmerston North.

Minimum age increased to 16.

New Zealand has more amateurs per capita than any other country.

1954 French, Italian, Spanish and Dutch languages allowed on air as plain languages.

First 10 GHz contact, between Jack King ZL2AKP and Ron Morgan ZL2GQ.

Roy Pottinger ZL2IL makes first transistor transmitter contact with fellow Dunedin amateur, then world distance record contact with Christchurch amateur.

1958 First Boy Scout JOTA.

ATV demonstrated by Harry Burton ZL2APC.

1959 50 to 51 MHz withdrawn for use for commercial TV.

First New Zealand-Britain RTTY contact, between Alec Hyndman ZL3HJ and G3CQE.

1960 Jock White ZL2GX achieves world's first DXCC 300.

1961 Trevor Kendrick ZL2HP first New Zealand amateur to hear OSCAR-1 satellite.

1962 March 10, Women Amateur Radio Operators' Club formed in Rotorua.

Maximum power limit raised to 150 W final anode input power.

Minimum age returned to 14.

Matamata amateurs establish first contact between glider and ground station.

1963 Non-Morse technician licence introduced for operation above 144 MHz.

Doug Gorman ZL2IY awarded MBE for services to amateur radio and search and rescue.

1967 Reciprocal licensing starts.

Roy Needham ZL1KG sets top world score in YL ISSB contest.

1968 NZART founder member of IARU Region III Association, Sydney. NZART representatives attend this and every subsequent Region III Conference.

1969 ZM prefix permitted for first time as alternative to ZL, to celebrate Cook bi-centenary.

World record 144 MHz E-M-E contact between John Morgan ZL1AZR and SM7BAE.

Bruce Rowlings ZL1WB appointed command station for OSCAR-5, later also for OSCAR-6 and OSCAR-7.

1970 Three grades of operator's certificate replace former two grades and HF permit.

Christchurch amateurs commission first amateur beacon and first repeater.

1971 Roy Needham ZL1KG first amateur outside the US to receive US Counties Award.

1972 All amateurs allowed to work through OSCAR-6 and subsequent satellites.

1973 Morse speed reduced to 12 wpm for Grade One Operator's Certificate.

1975 Wellington VHF Group world record 3300 MHz contact between Mt Murchison and Mt Ruapehu. 1983 extends record when transmits between Cape Reinga and Mt Egmont.

1976 1803 to 1813 kHz made available.

1977 Novice grade licence introduced.

1978 40 m band extended to 7.3 MHz on non-interference basis.

Wellington ATV repeater operated.

First 24 GHz contact, between Peter Williams ZL2ARW and John Yaldwyn ZL2TRV.

1979 50 to 50.15 MHz sharing arrangement introduced.

Fred Johnson ZL2AMJ attends World Administrative Radio Conference in Geneva as Amateur Service representative in New Zealand delegation.

Term of office for NZART President and Council extended to two years.

Jim Jackson ZL2BCG then Graham Alderson ZL3AAD set 432 MHz E-M-E world record when contact I5MSH. First of several E-M-E world record contacts for Alderson on this band.

Chuck Rademacher ZL1ADI wins IARU Radiosport Champs and sets world record. Repeats both feats the following year.

1980 Call-signs retained when amateurs move between radio districts.

1982 10.1 MHz band made available.

Non-Morse operators permitted on 51 to 53 MHz band.

NZART membership peaks at 4397.

1983 Extended band at 1.8 MHz and new bands above 47 GHz made available.

Amateurs regulate own band plans and emissions.

First ZL-ZL E-M-E contact between Graham Alderson ZL3AAD and John Shorland ZL2AQE.

World record 1296 MHz E-M-E contact between Graham Alderson ZL3AAD and PAØSSB. In 1985 Alderson extends record when he contacts F8TU.

World record 28 MHz Packet radio contact between Ian Ashley ZL1AOX and W3IWI.

Tom Clarkson ZL2AZ awarded MBE for services to amateur radio.

1984 QSL Bureau free service to NZART members. Non-members continued to pay 10 cents a card.

Chatham, Kermadec and Auckland/Campbell Islands become ZL7, ZL8 and ZL9 respectively.

Robin McNeil ZL3TIG first to operate from top of Mt Cook.

1985 18.068 MHz band made available.

IARU Region III Conference held in Auckland, attended by IARU President and ITU Secretary-General. IARU Administrative Council meets in conjunction with the conference.

Bob Knowles ZL1BAD appointed IARU international intruder watch co-ordinator.

Ian Ashley ZL1AOX appointed command station for OSCAR-10 and later OSCAR-13.

1986 New system of General, Limited and Novice licences established.

1987 24.89 to 24.99 MHz made available.

610–620 MHz band extended to 622 MHz.

Amateurs allowed to choose any vacant call-sign.

First link established between Auckland and Wellington in national repeater system.

Official Broadcast networked on 3900 kHz and VHF repeaters.

World record 2304 MHz E-M-E contact between John Shorland ZL2AQE and W3IWI.

Guy Kendall ZL2BIV first amateur to communicate from hang-glider.

Fred Johnson ZL2AMJ becomes Region III representative on IARU Administrative Council.

Tom Clarkson ZL2AZ receives Roy Stevens Memorial Trophy.

1988 80 m Novice band extended to 3.625 MHz.

Licensing age limit abolished.

Amateurs allowed to handle third party welfare messages within New Zealand.

Non-amateurs allowed to speak on air.

World record 50 MHz E-M-E contact between Graham Jonas ZL2BGJ and WA4NJP.

1989 Dan Wilkinson ZL2AB awarded QSM for services to amateur radio.

1990 Novices grade operators granted access to 144–148 MHz band.

Access to all HF bands immediately on gaining general grade licence.

Access to 165–190 kHz and 922–927 MHz subject to special conditions.

610–622 MHz band realigned to 614–622 MHz.

2.3–2.45 GHz band restricted to 2.396–2.45 GHz.

NZART runs amateur radio written exams for the first time.

1991 Visiting amateurs from countries with no reciprocal agreement with New Zealand allowed to operate.

1992 Dave Brown ZL1HY hands in call-sign after becoming world's top DXer, having contacted all 323 counties on current DXCC list and 375 out of 377 on all-time list.

Ron Kingston ZL4MK awarded QSM for services to search and rescue and civil defence.

1993 NZART runs Morse tests for first time.

New Zealand first outside country to have licences recognized by European Conference of Postal and Telecommunications Administrations.

1994 Number of amateur radio licences peaks at 6613.

New Zealand amateurs compete at ARDF world champs in Sweden.

1997 AREC re-named Amateur Radio Emergency Communications.

Rebecca Butcher ZL3URB becomes youngest ever licensed amateur, aged 8.

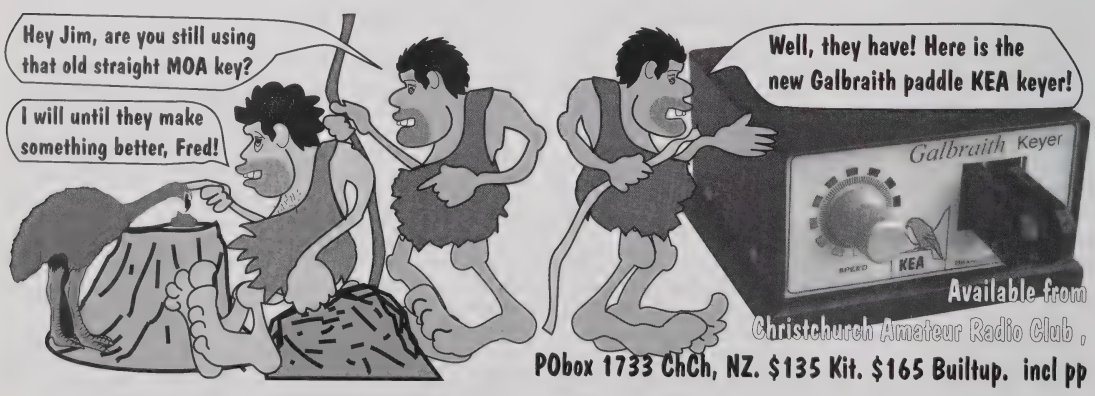
World record 10 GHz E-M-E contact between Greg Storz ZL1GSG and DJ7FG.

NZART publishes New Zealand amateur radio history, *Ham Shacks, Brass Pounders & Rag Chewers*.

1998 NZART sets up Radioscience Education Trust.

Young Amateurs of New Zealand formed.

1999 Campbell Island DXpedition makes world record 90,000 plus contacts.


Hey Jim, are you still using that old straight MOA key?
I will until they make something better, Fred!
Well, they have! Here is the new Galbraith paddle KEA keyer!
Galbraith Keyer
KEA
Available from
Christchurch Amateur Radio Club ,
PObox 1733 ChCh, NZ. $135 Kit. $165 Builtup. incl pp

NEW ZEALAND AMATEUR RADIO STATIONS
ZL1 CALL-SIGNS

ZL1AA Auckland Branch NZART (Inc.), see Branch Directory
ZL1AAA Gordon, B. D., 11 Siota Crescent, Kohimarama, Auckland 1005
ZL1AAB Cardy, J., 28 City View Terrace, Birkenhead, Auckland 1310
ZL1AAC Hammond, K. F., 14 Coppelia Avenue, Omokoroa, RD 2, Tauranga 3021
ZL1AAE Yearsley, J. K., Boat Harbour Road, RD 1, Whitianga 2856
ZL1AAF Walker, R. L., 128 Buffalo Beach Road, Whitianga 2856
ZL1AAH Backhouse, R. B., Ararimu Valley Road, RD 2, Waimauku 1250
ZL1AAI De Jong, J. W., PO Box 79-311, Royal Heights, Auckland 1230
ZL1AAJ Williams, H. J., 30 Halberg Street, Glenfield, Auckland 1310
ZL1AAK Stephens, C. H. L., 56 Karaka Street, Takapuna, Auckland 1309
ZL1AAL Carruthers, A. J., 61 Drake Street, Howick 1705
ZL1AAM Scott, P. L., 25 Chatsworth Crescent, Pakuranga 1706
ZL1AAN Faulkner, H. T., 8 Kapai Road, Devonport, Auckland 1309
ZL1AAO Steel, L. B., 121 Shelly Beach Road, Kopurahi, RD 4, Thames 2821
ZL1AAQ Palmer, W. J., 9 Tennyson Street, Morningside, Whangarei 0101
ZL1AAR Details unknown
ZL1AAS Scott, A., 25a Rodney Road, Howick 1705
ZL1AAU Elley, Bryce, 26 Richmal Street, Waihi 2981
ZL1AAY King, O. L., 8 Gracechurch Drive, Papatoetoe, RD, Auckland 1730
ZL1AAZ Pratt, W. R., 1b Parewaitai Court, Papamoa 3003
ZL1AB North Shore Branch, see Branch Directory
ZL1ABB Beck, Bryce, 49 Haigh Access Road, RD 4, Albany 1311
ZL1ABC Biddle, R. R., c/- Wesley College, PO Box 58, Pukekohe 1800
ZL1ABD Wise, F. B., 19/14 Royal Road, Massey, Auckland 1008
ZL1ABE Details unknown
ZL1ABL Dale, A. J., 61 Rodney Street, Wellsford 1242
ZL1ABM Humphrey, M. L. G., 1009 Tararu Road, Thames 2801
ZL1ABN Reay, M. J. F., 16 Priscilla Crescent, Hamilton 2001
ZL1ABP Rutter, K. L., 707 Richardson Road, Hillsborough, Auckland 1004
ZL1ABQ McGill, A. K., 15 Manapouri Place, Pakuranga 1706
ZL1ABS Sheffield, M. J., 176 Albany Highway, Albany, Auckland 1311
ZL1ABX Dukes, J. R., 102 Awaruku Road, Torbay, Auckland 1311
ZL1ABZ Johnson, I. P., 15 Muirend Avenue, Tokoroa 2392
ZL1AC Western Suburbs Radio Club, see Branch Directory
ZL1ACC Davies, J. H., 22 Harapaki Road, Meadowbank, Auckland 1005
ZL1ACD Coakley, A. H., 31 Johnston Road, Kawakawa 0291
ZL1ACE Winder, S. P., 138 Wellington Street, Opotiki 3092
ZL1ACG Caldwell, E. G., 23 Clyma Place, Massey, Auckland 1008
ZL1ACH ten Velde, R. J. M., 8 Matipo Place, Tokoroa 2392
ZL1ACI Pearce, R. E., 2 Leicester Parade, Howick, Auckland 1705
ZL1ACJ Turner, R. H., 7 Keiss Street, Blenheim 7301
ZL1ACK Marshall, R. F., PO Box 6659, Wellesley Street, Auckland 1036
ZL1ACL Field, Rina, 7a Smith Street, Waipukurau 4176
ZL1ACN Messent, D. L., Main Road, PO Box 23, Murupara 3272
ZL1ACO Grusning, H. N., 28 Ocean Beach Road, Tairua 2853
ZL1ACR Ramsay, F. M. (Dr), Private Bag, Totara North 0471
ZL1ACT Bate, A. M., Address unknown
ZL1ACV Twiss, D. G. L., PO Box 884, Taupo 2730
ZL1ACX Rous, B. W., 56 Tamahere Drive, Glenfield, Auckland 1310
ZL1ACY Billing, C. J., 16 Dobell Road, Whangaparaoa 1463
ZL1ACZ Williams, B. C., 4 Kay Drive, Blockhouse Bay, Auckland 1007
ZL1AD Blackett, D. J., 56 Church Street, Northcote, Auckland 1310
ZL1ADA Baker, J. R. (Mrs), 28 Chorley Avenue, Massey, Auckland 1008
ZL1ADB Ataya, P. G. E. G., "The Oak", 4204 Great North Road, Henderson, Auckland 1008
ZL1ADC Meharry, R. G., 111 Clarkin Road, Fairfield, Hamilton 2001
ZL1ADD Irving, E. B., 26 Dudley Avenue, Huntly 2191
ZL1ADE Duffy, E. J., 22 Duke Street, Mt Roskill, Auckland 1004
ZL1ADG Hunt, C. W., PO Box 233, Otorohanga 2564
ZL1ADH Nichols, D. E. G., 8 School Road, Te Atatu, Auckland 1008
ZL1ADI Rademacher, C. A., Wrights Road, RD 2, Albany 1311
ZL1ADL Wilkins, D. N., 5 Ethel Street, Sandringham, Auckland 1003
ZL1ADM de Lacey, N. E., 1 Hall Lane, Frankton, Hamilton 2001
ZL1ADO Sullivan, J. K., 153 St Heliers Bay Road, St Heliers, Auckland 1005
ZL1ADP Medland, F. J., 11 The Lane, Medlands Bay, Great Barrier Island 1236
ZL1ADQ Lawrence, P., 2/15 Summermist Drive, Northpark, Howick 1705
ZL1ADR Reinhard (Jnr), P. A., 20 Woodfield Avenue, Palmerston North 5301
ZL1ADS Tibbles, W. J., 19 Kotanui Street, Army Bay, Whangaparaoa 1463
ZL1ADT Orr, K. R. (Dr), PO Box 95-151, Swanson, Auckland 1230
ZL1ADW Clark, B. E., 88 Lincoln Park Avenue, Massey, Auckland 1008
ZL1ADX The Church of Jesus Christ of Latter Day Saints Radio Club, PO Box 33-342, Takapuna, Auckland 1332
ZL1AE Croonen, P. W., 630 Kaipaki Road, RD 1, Ohaupo 2452
ZL1AEL Stanley, J. W., PO Box 252, Whangarei 0115
ZL1AF Ogier, I. W., 32 Rangitane Street, Palmerston North 5301
ZL1AFA James, D. L., 8 Kesteven Avenue, St Heliers, Auckland 1005
ZL1AFB Offord, J. L., 43 Queens Road, New Plymouth 4601
ZL1AFC Neighbours, E. R., 20a Seaview Road, Otumoetai, Tauranga 3001
ZL1AFD Osborne, R., PO Box 2098, Tauranga 3015
ZL1AFE De Renzy, P., Puketutu Road, RD 2, Matamata 2271
ZL1AFF Fleming, J., 43 Burns Street, Leamington, Cambridge 2350
ZL1AFJ Phillips, J. F. E., 36 Mt Roskill Road, Mt Roskill, Auckland 1004
ZL1AFK Details unknown
ZL1AFL Flatt, D. A., 116 Weatherly Road, Torbay, Auckland 1311
ZL1AFM Bellamy, P. R., 36 Eaton Road, Hillsborough, Auckland 1004
ZL1AFQ Rosan, D. A. R., PO Box 65-147, Mairangi Bay, Auckland 1330
ZL1AFS Cowley, T. C. M., 850 Beach Road, Waiake, Auckland 1310
ZL1AFT Walker, K., 28 Darren Crescent, Bucklands Beach, Auckland 1706
ZL1AFU Murphy, R. J., 19 Litten Road, Howick, Auckland 1704
ZL1AFV Boyce, A. R., 26 Shakespeare Street, Cambridge 2351
ZL1AFX Kilsby, M. R., 5 Niagara Crescent, Lynfield, Auckland 1004
ZL1AFY Details unknown
ZL1AFZ McLean, J. P., George Road, RD 3, Pahiatua 5470
ZL1AG Gilbert, L. H., c/- The Meadowback Home & Hospital, 153 Meadowbank Road, Meadowbank, Auckland 1005
ZL1AGA Rasmussen, J. W., 65 Smith Street, Matamata 2271
ZL1AGC Passau, K. M., PO Box 628, Papakura, Auckland 1730
ZL1AGD Deng, A. G., 65 Orams Road, Manurewa, Manukau City 1702
ZL1AGG Bycroft, P. E., 253 Shirley Road, Papatoetoe, Auckland 1701
ZL1AGK Details unknown
ZL1AGM Sloane, J. P., 14 Whiteacres Drive, Pakuranga, Auckland 1706
ZL1AGN Campbell, M. H., Fencourt Road, RD 1, Cambridge 2351
ZL1AGP Horwood, Hannah, 233 King Street, Whakatane 3080
ZL1AGR Cotton, J. K., 13a Gollan Road, Mt Wellington, Auckland 1006
ZL1AGS Collins, P. E., 185 Victoria Street, Cambridge 2351
ZL1AGT Taylor, E. R., 18 The Circle, Whangaparaoa 1463
ZL1AGU Sterling, I. H., 27 Cromwell Street, Mt Eden, Auckland 1003
ZL1AGV Dixon, L. N., 18 Koru Street, Mangere Bridge 1701
ZL1AGW McDonald, D. F., 6 Margaret Place, Ha Hei, RD 1, Whitianga 2856
ZL1AGX Clark, A. T., 1/9 Eltham Road, Kohimarama, Auckland 1005
ZL1AGY Easton, J. A., RD 9, Wheki Valley Hill, Whangarei 0121
ZL1AGZ Delaney, J. D., 41 Birdwood Road, Swanson, Auckland 1008
ZL1AH Wightman, J. D., 99c Eighth Avenue, Tauranga 3001
ZL1AHC Grayston, G. H., 250 Mangapiko Street, Te Awamutu 2400
ZL1AHD Franklin, M. J., PO Box 252, Albany 1330
ZL1AHK Tester, W., 48 Pulham Road, Warkworth 1241
ZL1AHL McLellan, G. L., 1 Icarus Place, Rotorua 3201
ZL1AHM Bell, A. D., 182 Ocean Road, Ohope 3085
ZL1AHN Milford, R. T., 6/43 Shakespeare Road, Milford, Auckland 1309
ZL1AHO Sykes, R. J., 263 Shirley Road, Papatoetoe 1701
ZL1AHP Greendale, L. S., 22 School Road, Paihia, Postal: PO Box 301, Paihia 0252
ZL1AHQ Field, George, 7a Smith Street, Waipukurau 4176
ZL1AHR Nolan, J. I., 5/25 West Coast Road, Glen Eden, Auckland 1007
ZL1AHS Turnwald, T. F., 63 Beach Road, Castor Bay, Auckland 1310
ZL1AHT Buckland, I. D., 490 Coatesville Highway, RD 3, Albany 1311
ZL1AHW Hoban, R. P., 462 Kaitemako Road, RD 5, Welcome Bay, Tauranga 3021
ZL1AHX King, Andrew, 2/106 Victoria Street, Onehunga, Auckland 1006
ZL1AHZ Kidd, B. F., Addison Road, Parua Bay 0240
ZL1AI Badman, R. G., 146 Totara Drive, Pukete, Hamilton 2001
ZL1AIA Baylis, M. B., 1 Munro Street, Onerahi, Whangarei 0101
ZL1AIB Morris, N. C., Unit 3, 659 Mt. Albert Road, PO Box 24-139, Royal Oak, Auckland 1030
ZL1AIC Dewar, Dave, 6 Syntax Place, Conifer Grove, Takanini 1702
ZL1AID Leng, W. K., 36 Great South Road, Papatoetoe 1701

ZL1AIF Reid, D. M., 123 McCoy Road, RD 2, Opotiki 3092
ZL1AIH McCormack, R. K. F., 181 Ararimu Valley Road, Waimauku 1250
ZL1AII McFarlane, I. R., 18 Hakarimata Road, Ngaruawahia 2171
ZL1AIJ Blake, C. B., Blackwell Drive, Tryphena, Great Barrier Island 1236
ZL1AIK Lewis, P. J., 31 Percy Bear Terrace, Onekawa, Napier 4001
ZL1AIM Kebble, S. W., 228, State Highway 2, Bethlehem, Tauranga 3001
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ZL1AIQ Veale, G. A., 74 Don Street, Invercargill 9501
ZL1AIR Armstrong, B. E., Main Road, PO Box 282, Mangonui 0557
ZL1AIS Dyer, R. J., 16 Blundell Avenue, Kawerau 3075
ZL1AIU Eastern Bay of Plenty Branch NZART (Inc), see Branch Directory
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ZL1AJC Cummins, Joan, Te Ata Rest Home, 588 Teasdale Street, Te Awamutu 2400
ZL1AJD Krippner, F. J., Te Rore, RD 6, Te Awamutu 2400
ZL1AJE Ansell, M. E., Address unknown
ZL1AJF Krippner, J. A., Te Rore, RD 6, Te Awamutu 2400
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ZL1AJK Wood, W. B., 8 William Souter Street, Forrest Hill, Auckland 1309
ZL1AJL Johnston, Carol, 6 Syntax Place, Conifer Grove, Takanini 1702
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ZL1AJN Holmes, W. S., RD 1, Waiuku 1852
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ZL1AJY Barratt, M. P., 6 Brussells Place, Birkenhead, Auckland 1310
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ZL1AKC Crook, B. W., 3 Icarus Place, Rotorua 3201
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ZL1AKM Details unknown
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ZL1AND Turner, A. B., 7 Acmena Lane, Pakuranga, Auckland 1706
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ZL1AOE Gillgren, S. J., 7 Graham Road, Gisborne 3801
ZL1AOF King, J. L., 26 Pouwhare Street, Whakatane 3080
ZL1AOH Stewart, M. I., 4 Page Place, Hamilton 2001
ZL1AOI Trethowen, V. G., 1/22 Blockhouse Bay Road, Avondale, Auckland 1007
ZL1AOL Shacklock, F. W., 14 Paparoa Road, Howick 1705
ZL1AOM Brown, M. W., 290 Douglas Avenue, Te Awamutu 2400
ZL1AON Edginton, K. S., 69 East Street, Hamilton 2001
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ZL1AOV Matheson, Joyce, Mata Road, RD 1, Kohukohu 0570
ZL1AOW Frankham, D. W., 3a Kaurilands Road, Titirangi, Auckland 1007
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ZL1APM Bowers, J., 7 Sandford Place, Hamilton 2001
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ZL1ARC Details unknown
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ZL1ARG Millar, R. W. K., Mullet Point, RD No 2, Warkworth 1241
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ZL1ASD Bayley, E., 11 Trimmer Terrace, Papatoetoe 1701
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ZL1ASY McGaughey, J. D., RD 1, Russell 0255
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ZL1ATW Meenagh, M. B., 223 Te Tomo Street, Te Awamutu 2400
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ZL1BAY Tarlton, B. M., 8 North Road, PO Box 81, Kaitaia 0500
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ZL1BBC Details unknown
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ZL1BC Bomar, C. P., Briam Trail Farm, RD 2, Kaiwaka 0582
ZL1BCA Batkin, B. W., Batkin Road, Hunua, RD 4, Papakura 1730
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ZL1BCH Davis, Terry, 1/115 Great South Road, Manurewa, Auckland 1702
ZL1BCI Sinclair, N. S., 29 Meadowland Street, Tauranga 3001
ZL1BCL Lewis, V. A., 38b Burwood Road, Matamata 2271
ZL1BCN Messent, A. J. (Mrs), Main Road, PO Box 23, Murupara 3272
ZL1BCO Taupo Branch 60, see Branch Directory
ZL1BCV White, J. W., 633b Kamo Road, Kamo, Whangarei 0101
ZL1BCW Webber, H. C., 6 Brabant Street, Whakatane 3080
ZL1BD Wilson, A., Waingaro Road, RD 1, Ngaruawahia 2171
ZL1BDA Wright, C. C., 3 Livingstone Street, Milford, Auckland 1309
ZL1BDB Trevena, M. R., 1 Talga Court, Conifer Grove, Takanini 1702
ZL1BDD Bowman, M. J., 8 Morice Place, Browns Bay, Auckland 1311
ZL1BDE Visser, P., 4 Kauri Crescent, Matamata 2271
ZL1BDF Petherick, G. R., 84 Aroha Avenue, Morningside, Auckland 1003
ZL1BDG Mogford, F. L., 74 Buchanan Street, Opotiki 3092
ZL1BDH Latham, G. W., 5a Halberg Crescent, Whakatane 3080
ZL1BDI Draper, N., 61 Churchill Road, Murrays Bay, Auckland 1311
ZL1BDJ Monk, Ena, 23 Matipo Avenue, Rotorua 3201
ZL1BDK Phillips, K. A., 15 Shanley Crescent, Waiuku, Auckland 1852
ZL1BDL Detail unknown
ZL1BDM Hansen, A. F., PO Box 809, Whangarei 0115
ZL1BDO Mancer, E. S., 10 Delshaw Avenue, Stanmore Bay, Whangaparaoa 1463
ZL1BDP James, J. R., PO Box 471, Taupo 2730
ZL1BDQ Wilkins, S. J., c/- Counter, NZ Post, Warkworth, Auckland 1241
ZL1BDS Details unknown
ZL1BDT Ngakuru, N. H., 31 Wihongi Street, Kaikohe 0400
ZL1BDU Catton, R., 39 Andrew Road, Howick 1705
ZL1BDV Schischka, G., 4 Gilliam Street, New Lynn, Auckland 1007
ZL1BDW West, B. D., 67 Woodlands Road, Opotiki 3092
ZL1BDY Seakins, J. M., 99 Exmouth Road, Northcote, Auckland 1310
ZL1BDZ Hoban, Clarrie, 462 Kaitemako Road, RD 5, Welcome Bay, Tauranga 3021
ZL1BE Collins, P., 395 East Coast Road, Mairangi Bay, Auckland 1311
ZL1BEB Williams, P., Kaihere, RD 1, Ngatea 2852
ZL1BEG Begg, J. W. K., 27a Shanaway Rise, Northcote, Auckland 1310
ZL1BEJ McCabe, B. R., 130 Takahe Road, Titirangi, Auckland 1007
ZL1BEK McTurk, P. T. R., 40 Silverton Road, Waihi 2981
ZL1BEL Lees, B., c/- 11 Notley Street, Westmere, Auckland 1002
ZL1BEM Lockwood, D. C., 7 Adams Street, Waihi 2981
ZL1BEN Doggett, George, c/- 46 Glenvista Place, Glenfield, Auckland 1310
ZL1BEP Sharpe, N. R., Inlet Road, Kerikeri 0470
ZL1BEQ McGee, S. R., Lewis Road, Otakiri, RD 3, Whakatane 3080
ZL1BEU Jamieson, L. I. D., 122 Ngunguru Road, RD 3, Whangarei 0121
ZL1BEX Wilson, A. L. G., 16 Rahiri Road, Mt Eden, Auckland 1003
ZL1BEY Smart, J. B., 157 Rodney Street, Wellsford, North Auckland 1242
ZL1BEZ Miller, P. G., 2 Downing Street, Chartwell, Wellington 6004
ZL1BF Hall, R. J., 9 Lowtherhurst Road, Massey, Auckland 1008
ZL1BFB Walker, Ian, 51 Caronia Crescent, Mt Roskill, Auckland 1004
ZL1BFD Potts, G. C., 169 Alfriston Road, Manurewa 1702
ZL1BFE Harland, J. C., 9 Papanui Street, Tokoroa 2392
ZL1BFH Perkins, I. M., 74 Tawari Street, Matamata 2271
ZL1BFK Frakes, M. C., 29 Riverside Drive, Waiuku 1852
ZL1BFM Andrews, T. I., 427 Fraser Street, Tauranga 3001
ZL1BFN Mathew, J. C. H., PO Box 234, Blenheim 7315
ZL1BFR Beere, J. E. L., Main Road, RD 1, Howick 1730
ZL1BFS Birt, K. D., PO Box 1134, Gisborne 3815
ZL1BFX Broadley, C. L., 32 Waiotahi Creek Road, Thames 2801
ZL1BFY Donaldson, D. L., 80 Woolfield Road, Papatoetoe 1701
ZL1BFZ Robertson, D. J., 29c Youngs Road, Papakura 1703
ZL1BG Grumwald, J. B., RD 3, Tokerau Beach, Kaitaia 0500
ZL1BGA Martin, G. K. (Mrs), 26 Dundee Place, Blockhouse Bay, Auckland 1007
ZL1BGB Glover, D. R., 5 Wyman Place, Pakuranga 1706
ZL1BGD Marr, Lance, 22 Swan Crescent, Pakuranga, Auckland 1706
ZL1BGE Whitwell, G. R., 3 Grace Street, Matata, PO Box 46, Matata 3084
ZL1BGH George, L. H., 65 King Street, Opotiki 3092
ZL1BGI McCarthy, A. C., 1b Burden Avenue, Wainuiomata 6008
ZL1BGK Gordon, K. G., 117 Cashmere Avenue, Khandallah, Wellington 6004
ZL1BGN Rounthwaite, T., 18 Duncan Avenue, Henderson, Auckland 1008
ZL1BGS East, T. A., Rotongaro Road, RD 2, Huntly 2191
ZL1BGU Felt, B., Address unknown
ZL1BGV Roberts, M. J., 19 Canaandale Drive, Flagstaff, Hamilton 2001
ZL1BGW Maude, R. de M., Address unknown
ZL1BH Creasy, S. C., Pamuzinda Lodge, 14 Taharepa Road, Taupo 2730
ZL1BHB Riley, S. G., 18 Charles Road, Rotorua 3201
ZL1BHC Walker, A. N., Crane Road, RD 1, Kamo 0121
ZL1BHD Wright, S. W., 130 James Street, Whakatane 3080
ZL1BHE Matthews, J. F., 26 Ocean Vew Road, Northcote, Auckland 1310
ZL1BHF Sloan, W. J., 20 Acorn Street, Royal Oak, Auckland 1003
ZL1BHG Robinson, I. A. S., Ostrich Farm, RD, Pukekohe 1800
ZL1BHH Ferguson, M. E., 5b Terrace Avenue, Mount Maunganui 3002

ZL1BHJ Dekker, J., 17 Velma Crescent, Hamilton 2001
ZL1BHQ Powell, J. F., 47 Becroft Drive, Forrest Hill, Auckland 1309
ZL1BHS Deverell, H. C., 44 Mackesy Road, Whangarei 0101
ZL1BHT Newcombe, B. R., 20b Fourth Avenue, Tauranga 3001
ZL1BHU Watson, A. G., 204a Valley Road, Mount Maunganui 3002
ZL1BHV Davis, W. H., 55 Pihanga Street, Taupo 2730
ZL1BHW Parkinson, M. A., 23c Eason Street, Rotorua 3201
ZL1BHY Young, C. R., 1 Aotearoa Terrace, Murrays Bay, Auckland 1311
ZL1BI Freeman, Shirley, 236a Scenic Drive, Titirangi, Auckland 1007
ZL1BIB Hookham, C. R., 2/1006 Beach Road, Torbay, Auckland 1311
ZL1BIC Byrnand, J. L., 5 Te Anau Place, Tikipunga, Whangarei 0101
ZL1BID Davis, E. T., 13 Dundee Place, Blockhouse Bay, Auckland 1007
ZL1BIG Biggins, A. J., 16 Erin Street, Tikipunga, Whangarei 0101
ZL1BIK McKechie, K. H., 13 Cron Avenue, Te Atatu South., PO Box 69-051, Glendene, Auckland 1230
ZL1BIP Bingham, L. H., Walker Road East, PO Box 72, Katikati 3063
ZL1BIQ Puffett, K. H., 51 McKean Avenue, Manurewa 1702
ZL1BIT Davy, N. C., Chatham Avenue, Albany, RD 3, Auckland 1311
ZL1BIV Garrett, J. W., 20 First View Avenue, Beachlands, Auckland 1705
ZL1BIW Ward, L., 60 Ranfurly Street, Dargaville 0300
ZL1BIX Soppet, D. A., 4a Ruarangi Road, Mt Albert, Auckland 1004
ZL1BIZ Henry, Elva, 27 McRae Road, Mt Wellington, Auckland 1006
ZL1BJ Breach, J., Omokoroa Road, Tauranga 3021
ZL1BJA Hendriksen, R. H. E., RD 5, Wellsford 1242
ZL1BJB Beale, D. J., PO Box 148, Drury, Auckland 1730
ZL1BJC Orchard, Lin, PO Box 190, Whakatane 3080
ZL1BJE Appleby, W. M., 8 Brightside Road, Whangaparaoa, Hibiscus Coast 1463
ZL1BJF Henderson, A. R., 322 St Heliers Bay Road, St Heliers, Auckland 1005
ZL1BJI Goodsir, J. W., 24 Te Kapa Place, Snells Beach, Warkworth 1241
ZL1BJJ Morris, T. J., 38 Strathmore Street, Matua, Tauranga 3001
ZL1BJL Williams, C., Stokes Road, RD 2, Cambridge 2351
ZL1BJM Cain, M. C., 20 Sayegh Street, St Heliers, Auckland 1005
ZL1BJN Schlef, W. K., 13 Roslyn Road, Mt Wellington, Auckland 1006
ZL1BJP Parkinson, D. J., 36 Western Road, Otumoetai, Tauranga 3001
ZL1BJT Dougan, J. K., 35 Tunis Road, Panmure, Auckland 1006
ZL1BJU Thompson, N. K., 11 Homestead Place, Glenview, Hamilton 2001
ZL1BJV Turvey, W. W., 3/11 Faulkner Road, Northcote, Auckland 1310
ZL1BJZ Farmer, J. B. S., 88 Ngapuhi Road, Remuera, Auckland 1005
ZL1BK Long, R. J., 175 Green Lane Road, Greenlane, Auckland 1005
ZL1BKA McIntosh, G. S., 4 Alexander Avenue, Maraetai, Auckland 1705
ZL1BKD Busch, Colin, PO Box 372, Warkworth 1241
ZL1BKF Marshall, O. H., 16 Dunlop Drive, Pauanui Beach 2821
ZL1BKG Wilson, T. G., 53 Tirimoana Road, Te Atatu, Auckland 1008
ZL1BKI Salmond, A. R., 2/9 Tomintoul Place, Howick 1705
ZL1BKJ Sandlant, P. W., 17 Mayfair Crescent, Mairangi Bay, Auckland 1311
ZL1BKL Lister, Marion, 7 Sunnyview Avenue, Cockle Bay, Howick, Auckland 1705
ZL1BKM Engel, F. W., PO Box 6528, Wellesley Street, Auckland 1036
ZL1BKN Codlin, J. K., 8 Edgeware Road, West Harbour, Auckland 1008
ZL1BKO Harris, J. B., Velden, RD 1, Richmond 7031
ZL1BKP Searle, K. A., 58 Gordon Street, Gisborne 3801
ZL1BKQ Adams, C. W., 104b John Downs Drive, Browns Bay, Auckland 1311
ZL1BKT Dowding, P., 175 Beach Street, Waikouaiti 9063
ZL1BKU Davidson, B. J., 72 Monarch Avenue, Glenfield, Auckland 1310
ZL1BKV Coombs, M. J., 13 Crispian Place, Weymouth, Auckland 1702
ZL1BKX Rodgers, A. E., PO Box 19-006, Avondale, Auckland 1230
ZL1BKY Rankin, A. N., 90 Hastings Road, Mairangi Bay, Auckland 1311
ZL1BKZ Henry, R. I., 27 McRae Road, Mt Wellington, Auckland 1006
ZL1BL Huntly Branch 17 Amateur Radio Club, see Branch Directory
ZL1BLB Churcher, B. R., 80 Hepburn Road, Glendene, Auckland 1001
ZL1BLC Morris, T. N. J., 10 Sylvania Crescent, Lynfield, Auckland 1004
ZL1BLD Ward, M. T., Okokako Road, RD 3, Kerikeri 0470
ZL1BLE Details unknown
ZL1BLG Borland, K., 2b Stella Drive, Kerikeri 0470
ZL1BLI Ockleston, E. W., 25 Killarney Street, Takapuna, Auckland 1309
ZL1BLK Elliott, K. L., 16/57 Richard Farrell Avenue, Remuera, Auckland 1005
ZL1BLQ Salmons, R. J., 2 Townhead Crescent, Tauranga 3001
ZL1BLR Fish, Len, 14 Willow Avenue, Hannah's Bay, Rotorua 3201
ZL1BLS Smith, J. B., 13 Selwyn Avenue, Titirangi, Auckland 1007
ZL1BLT Alderwick, Graham, 16 Foster Crescent, Belmont, Lower Hutt 6009
ZL1BLV Howells, D., 267 Pohutukawa Avenue, Ohope, Whakatane 3085
ZL1BLY Goodbrand, J. A., 4a Braintree Street, Kamo, Whangarei 0101
ZL1BLZ Tunnicliffe, G. W., 16 Wilding Avenue, Northcote, Auckland 1310
ZL1BM Molloy, B. L., 460 Great South Road, Huntly 2191
ZL1BMA Grey, G. R., 15 Tatyana Place, Royal Heights, Waitakere City 1008
ZL1BMB Moroney, P. R., 12 Pallant Street, Manurewa 1702
ZL1BMF Musgrave, J. L., Address unknown
ZL1BMG Slone, J., Thornton Road, RD 1, Cambridge 2351
ZL1BMH Baker, R. F., 2/18 Tui Glen Road, Birkenhead, Auckland 1310
ZL1BMJ Taylor, A. K., 65 Uxbridge Road, Howick 1704
ZL1BMN Lethbridge, B. R., PO Box 418, Paihia, Bay of Islands 0252
ZL1BMP MacMillan, L. P. A., 4/15 Godden Crescent, Mission Bay, Auckland 1005
ZL1BMQ Long, Alesha, 40 Morningside Road, Whangarei 0101
ZL1BMS Simmonds, B. M., 363 Cobham Drive, Hamilton 2001
ZL1BMT Haultain, A., 131 Riverside Drive, Whakatane 3080
ZL1BMV Walker, V. L., 51 Kings Road, Paihia 0252
ZL1BMW Lowry, M. R., Lowry Road, Bombay, Auckland 1850
ZL1BMX Greenaway, W. P., 8 Stewart Place, Hamilton 2001
ZL1BMY Clegg, R. J., 47 Churchill Road, Murrays Bay, Auckland 1311
ZL1BMZ Padgett, A. B., 22 Finnerty Avenue, Howick, Auckland 1705
ZL1BN Northern DX Association, c/- Murray Woodfield, ZL1CN, 72 Salamanca Road, Sunnynook, Auckland 1309
ZL1BNA Marr, W. R. G., 27 Houhere Place, Tikipunga, Whangarei 0101
ZL1BNB Newman, M. D., 30 Nikau Street, Wanganui 5001
ZL1BND Dowling, B. N., 47 Gray Avenue, Mangere East, Auckland 1701
ZL1BNG Orton, N. J., 32 Orchard Avenue, Enderley, Hamilton 2001
ZL1BNH Murphy, P. M., 153 Oaklands Road, RD 1, Papakura 1730
ZL1BNI Brant, P. A., 41 Regent Street, Papatoetoe 1701
ZL1BNJ Pedersen, W. J., 56b Union Street, PO Box 404, Opotiki 3092
ZL1BNK Painting, F. J., 26 Greenacres Drive, Kawakawa 0291
ZL1BNL Schrickel, H. J. E., 8 Macpherson Street, Remuera, Auckland 1005
ZL1BNM Larcombe, D. C., 5 McMillan Place, Howick, Auckland 1704
ZL1BNN Brill, A. J., 9 Marcel Place, Glenfield, Auckland 1310
ZL1BNO Twiname, M. H., 2/4 Burt Road, Mt Wellington, Auckland 1006
ZL1BNP Were, B. J., 28 Lachlan Drive, Dinsdale, Hamilton 2001
ZL1BNQ Gamble, Richard, 19a Chiania Place, Howick 1705
ZL1BNU Mancer, P. J., Address unknown
ZL1BNW Collin, J. V., 65 Paine Street, Judea, Tauranga 3001
ZL1BNX Toft, T. B., 19b Ngapuhi Road, Remuera, Auckland 1005
ZL1BNY Shakes, D. B., 12 Deuxberry Avenue, Northcote, Auckland 1310
ZL1BNZ Clough, D. L. W., 5 Kelly Street, Rotorua 3201
ZL1BOA Wigg, J. D., 42 Deep Creek Road, Torbay, Auckland 1311
ZL1BOE Muir, C. B., PO Box 38-756, Howick, Auckland 1730
ZL1BOF Urquhart, G. A., 9 Four Trees, Howick 1705
ZL1BOG Donnelly, D. R., 14 Seon Place, Birkenhead, Auckland 1310
ZL1BOI Bay of Islands Amateur Radio Club, see Branch Directory
ZL1BOK Rowntree, R. J., 400 Hillsborough Road, Hillsborough, Auckland 1004
ZL1BOM Glasgow, M. R., 124 Grange Road, Tauranga 3001
ZL1BON Bonnington, L. M., PO Box 75, Kaukapakapa 1250
ZL1BOQ Duffy, D. B. H., PO Box 1034, Papakura 1730
ZL1BOR McNamara, Lesley, 32 Galileo Street, PO Box 8, Ngaruawahia 2171
ZL1BOS Williams, J. B., Kainui Road, RD 1, Taupiri 2171
ZL1BOW Fendley, G. L., 10 Vanda Place, Greerton, Tauranga 3001
ZL1BP Harris, W. F. H., 80 Roberts Road, Te Atatu South, Auckland 1008
ZL1BPA Corin, T. G., PO Box 11-018, Ellerslie, Auckland 1131
ZL1BPB Smith, R. A., 37 Kensington Road, Waihi 2981
ZL1BPC Martin, F. B., 223 Bellevue Road, Tauranga 3001
ZL1BPD Cochrane, C. D., 100 Manaia Road, Tokoroa 2392
ZL1BPF Wilcox, H. J., 64 Taylor Road, Mangere Bridge, Manukau City 1701
ZL1BPI Ronke, B. R., Weston Lea Drive, RD 2, Hamilton 2021
ZL1BPJ Christensen, R. A., 2 Ainswork Road, RD 6, Te Puna, Tauranga 3021
ZL1BPK Junge, A. G., 128 Stanley Avenue, Te Aroha 2971
ZL1BPM Browne, Lorraine, 27 Vivian Drive, Omokoroa Beach, Tauranga 3051

ZL1BPN Johnson, E. A., 11 Kowhai Park Road, Maunu, Whangarei 0101
ZL1BPP Wilkins, D. J. H., 12 Valdese Rise, Browns Bay, Auckland 1311
ZL1BPQ Nettleingham, F. J., Matahui Road, Katikati 3063
ZL1BPU Greenman, M., 94 Sim Road, Karaka, RD 1, Papakura 1730
ZL1BPX Ansley, B. K., 3/21 Braodway, Picton 7372
ZL1BQ Auckland VHF Group (Inc), see Branch Directory
ZL1BQA Doell, E. D., 11 Sandspit Road, Waiuku 1852
ZL1BQC Woolf, P. H., 2 Bourbon Terrace, Karori, Wellington 6005
ZL1BQD Runciman, R. J., 36 Cardiff Road, Pakuranga, Auckland 1706
ZL1BQE Dix, K., 91 East Tamaki Road, Papatoetoe 1701
ZL1BQF Ryan, L. J., 12 Twin Wharf Road, Herald Island, Auckland 1008
ZL1BQI Milne, A. W., 27a Bramley Drive, Omokoroa Beach, Tauranga 3051
ZL1BQJ Tetenburg, C. R., Ward Road, RD 2, Rotorua 3221
ZL1BQK Shackleton, R. V., 8 Rongopai Place, Kaitaia 0500
ZL1BQL Robinson, L. K., Lot 4, 46 Pulham Road, Postal: PO Box 253, Warkworth 1241
ZL1BQM Walker, B. F., 71 Pleasant Road, Titirangi, Auckland 1007
ZL1BQO Hynds, A. G., PO Box 534, Tauranga 3015
ZL1BQP Buckton, M. D., 84 John Gill Road, Howick, Auckland 1705
ZL1BQW Armstrong, Christine, McIvor Road, RD 4, Whakatane 3080
ZL1BQX Clark, L. C., 36a Jubilee Crescent, Whakatane 3080
ZL1BQY Clayton, C. J., 21 Hope Farm Road, Pakuranga, Auckland 1706
ZL1BR Reed, W. A., PO Box 441, Whangaparaoa 1463
ZL1BRB Rompa, A. P. A., 22 Abbotleigh Avenue, Te Atatu, Auckland 1008
ZL1BRC Ross, S. J., 5 Roxy Terrace, Glendowie, Auckland 1005
ZL1BRE Kristensen, P., 224 Keenan Road, RD 3, Tauranga 3021
ZL1BRF Stormont, B. I., 101 Ascot Road, PO Box 43-024, Mangere, Auckland 1730
ZL1BRG Macken, Shirley, 515 Beach Road, Murrays Bay, Auckland 1310
ZL1BRI Crawford, W., 42 Forest Lake Road, Hamilton 2001
ZL1BRK Stewart, D. A., 10 Currell Way, Howick 1705
ZL1BRL Cornwall, P. J., 10 Park Avenue, Northcote, Auckland 1310
ZL1BRM McElwain, B. R., 2 Ruru Place, Omori, RD 1, Turangi 2751
ZL1BRN Norgate, M. H., PO Box 774, Whangarei 0115
ZL1BRO Brenner, B. N., 67 Norwood Road, Bayswater, PO Box 33-112, Takapuna, Auckland 1332
ZL1BRP Price, P. G., 67 St Andrews Drive, Bethlehem, Tauranga 3001
ZL1BRQ Macken, C. G. C., 515 Beach Road, Murrays Bay, Auckland 1310
ZL1BRR Wallace, M. R., 37 Church Street, Onerahi, Whangarei 0101
ZL1BRV Gardiner, P. R., 3 Nyssa Place, Totara Heights, Manurewa 1702
ZL1BRW Boghurst, A. D., 70 Ostend Road, Ostend, Waiheke Island 1240
ZL1BRX Bain, Eileen, 58 George Crescent, Buckland, RD 2, Pukekohe 1800
ZL1BRY Anderson, H. C., 37 Arkles Strand, Arkles Bay, Whangaparoa 1463
ZL1BRZ Hill, B., 104 Omaha Drive, RD 6, Omaha, Warkworth 1241
ZL1BS Scott, D. T. S., 237 Metcalfe Road, Ranui, Auckland 1008
ZL1BSA Rodgers, A. H., 22 Golders Place, Taupo 2730
ZL1BSB Sutherland, Charlotte, Ruaroa Road, Post Office, Kaitaia 0500
ZL1BSG Pearce, T. K. L., 23 Aurea Avenue, Pakuranga, Auckland 1706
ZL1BSM Te Aroha and District Radio Club (Inc), see Branch Directory
ZL1BSN Wallingford, N., 55 Watling Street, Tauranga 3001
ZL1BSS Hawker, A. R., 94 Harrington Road, Henderson, Auckland 1008
ZL1BSV Mace, R. J., 9 Grampian Street, Tokoroa 2392
ZL1BSX Richmond, M. N., 46 Kings Road, Paihia, Bay of Islands 0252
ZL1BSY Gerritsen, J., Address unknown
ZL1BTA Rodgers, Shirley, 19 Cradock Street, Avondale, Auckland 1007
ZL1BTB Pinfold, Mike, 28 McKenzie Road, Owhata, Rotorua 3201
ZL1BTF Rogers, L. A., PO Box 79, Kaitaia 0500
ZL1BTG Tomlinson, G. H. J., c/- Te Puke Country Lodge, No 1 Road, Te Puke 3071
ZL1BTI Moroney, Ron, 495 Seaview Road, Onetangi, Waiheke Island 1240
ZL1BTK Parkinson, R. J., 70 Vandeleur Avenue, Birkdale, Auckland 1310
ZL1BTL Rowe, N. G., 821 Clevedon-Kawakawa Bay Road, Clevedon, RD 5, Papakura 1750
ZL1BTM Stratford, N. E., 6 Stratford Drive, Cable Bay, Mongonui, Northland 0557
ZL1BTP Tubby, Laureen, 470 Beach Road, Papamoa 3001
ZL1BTQ Allen, R., 77 Church Street, Opotiki 3092
ZL1BTR Jeffares, R., Address unknown
ZL1BTU Orange, L. R., PO Box 40-262, Glenfield, Auckland 1330
ZL1BTW Halliday, H., 20 Hillcrest Road, Orewa, Auckland 1461
ZL1BTX van der Meulen, F. P., 20 Walter Street, Takapuna, Auckland 1309
ZL1BTY Maindonald, D. C., 83 Grafton Road, Auckland 1001
ZL1BTZ Dawe, L. J., 6 Linwood Avenue, Forrest Hill, Auckland 1309
ZL1BU Frederick, G. I., 96 Lacewood Drive, Taupo 2730
ZL1BUD Morris, G. A., Weston-Lea Drive, RD 2, Hamilton 2021
ZL1BUI Willis, R. P., PO Box 3102, Onerahi, Whangarei 0132
ZL1BUJ Mackey, C. J., RD 1, Kamo, Whangarei 0121
ZL1BUK Duske, J. S., 11 Pendene Place, Forrest Hill, Auckland 1310
ZL1BUL Holmes, N. E., 3 Wainoni Avenue, Point Chevalier, Auckland 1002
ZL1BUP Johnson, Fred, 49 Youngs Road, Papakura 1703
ZL1BUQ Haigh, W. H., 12 Kauri Loop Road, Oratia, Auckland 1007
ZL1BUR Linton, S. J., 190 Pokuru Factory Road, RD 5, Te Awamutu 2400
ZL1BUS O'Brien, T. N., Wisemans Road, RD, Waitoa 2973
ZL1BUT Eggleton, P. W., PO Box 109, Russell 0255
ZL1BUU Levin, P. C., Gower Road, RD 2, Taupiri 2171
ZL1BUX Atchinson, Inez, 9/743 Great South Road, Manukau City, Auckland 1702
ZL1BUY Finn, W. J., McLeods Bay, RD 4, Whangarei 0121
ZL1BUZ Pont, A., 23 Mount View Drive, Rotorua 3201
ZL1BV Birch, R. W., Riverside Drive, PO Box 5092, Regent, Whangarei 0130
ZL1BVA Cullen, J. K., 6 Icarus Place, Rotorua 3201
ZL1BVB Yuen, S. T. (Mike), 7 Dallas Place, New Windsor Heights, Auckland 1007
ZL1BVE Lelieveld, J. J., 85-4 Admiral Crescent, Flagstaff, Hamilton 2001
ZL1BVJ Jones, P., 41 Caronia Crescent, Mt Roskill, Auckland 1004
ZL1BVK Learmond, A. H., 14 Takapu Street, Henderson, Auckland 1008
ZL1BVM Sharman, R., PO Box 602, Thames 2815
ZL1BVN van der Hulst, P. W., Matangi Road, RD 4, Hamilton 2021
ZL1BVO Messenger, G. E., 104 Elizabeth Street, Taupo 2730
ZL1BVP Chang, J. Y. S., 6 Esperance Road, Glendowie, Auckland 1005
ZL1BVS Marquart, S. A. R., 29 Clyside Avenue, Bucklands Beach 1706
ZL1BVT Slegh, J. P. (Miss), 2/69a Symonds Street, Royal Oak, Auckland 1006
ZL1BVV Boylan, R. P., 1 Ceramco Place, Torbay, Auckland 1311
ZL1BW Woltersdorf, W. G. E., 105 Freyberg Street, Otumoetai, Tauranga 3001
ZL1BWB Humphrey, G. A., 7 Scott Street, Tauranga 3001
ZL1BWC Comber, J. P., 21 Castor Place, Rotorua 3201
ZL1BWD Dobbs, L., Address unknown
ZL1BWG Details unknown
ZL1BWH Sheldon, B. R., 16 Carter Street, Mount Maunganui 3002
ZL1BWI Rose, A., 34 Lyndhurst Road, Te Atatu South, Auckland 1008
ZL1BWK McConnochie, B. D., 8 Farmer Street, Te Aroha 2971
ZL1BWP Horn, B. R., 5 Monique Place, Hamilton 2001
ZL1BWQ Le Cornu, Ethel, Kiwitahi, RD 1, Morrinsville 2251
ZL1BWS Harris, J. M., 21 Tapper Crescent, Tikipunga, Whangarei 0101
ZL1BWV Thompson, G. M., Pungaere Road, PDC, Waipapa 0470
ZL1BWY Collins, S. J., 13 Paratai Crescent, Whangarei 0101
ZL1BWZ Purser, W., PO Box 5677, Wellesley Street, Auckland 1036
ZL1BXA Buxton, H. C., 32 Castleton Street, Birkdale, Auckland 1310
ZL1BXB Grut, M. A. (Mrs), 97 Tiri Road, Whangaparaoa 1463
ZL1BXD Vencatachellum, V., 47 Ayton Drive, Glenfield, Auckland 1309
ZL1BXF Young, B., 44 Toroa Street, Torbay, Auckland 1311
ZL1BXH Croucher, P. J., 739 Park Road, Te Awamutu 2400
ZL1BXJ Eman, J. J., 6 Shakespeare Road, Milford, Auckland 1309
ZL1BXK Herrold, N. G., Hall Road, RD 1, Waiuku 1852
ZL1BXM Miers, E. R., RD 1, Dargaville 0300
ZL1BXO Grut, C. St. C., 97 Tiri Road, Whangaparaoa 1463
ZL1BXP Walsh, Alison, Kereone, RD 1, Morrinsville 2251
ZL1BXS Miller, P. G., Gilbert Mair Rise, RD 1, Russell 0255
ZL1BXT James, C. H., 1037 Heaphy Terrace, Hamilton 2001
ZL1BXU Davis, L. H., 8 Muritai Street, Taupo 2730
ZL1BXW Modderman, E. J., Bycroft Road, RD 2, Drury 1750
ZL1BXX Details unknown
ZL1BY Opotiki Amateur Radio Club, see Branch Directory
ZL1BYA Martinson, L. R., 31 Riverside Drive, Waiuku 1852
ZL1BYC Cornish, George, 580 Great South Road, Papatoetoe 1701
ZL1BYD Emmett, G. J., 7 Tupaki Place, Pakuranga, Auckland 1706
ZL1BYE Thomas, R. S., 54 Lynmore Avenue, Rotorua 3201
ZL1BYF Werder, K. J., Springdale, RD, Waitoa 2973
ZL1BYG Morey, E. J., 301 Fairview Road, Te Awamutu 2400
ZL1BYI Ramsay, I. S., 8 Locke Avenue, Hillsborough, Auckland 1004
ZL1BYL Alloway, F. R., 311 Barrowclough Road, Whangamata 2982
ZL1BYN Thompson, N. M., 75 Walworth Avenue, Pakuranga, Auckland 1706
ZL1BYO Williamson, B. M., 158 Elizabeth Drive, Tokoroa 2392
ZL1BYP Kennedy, A. G., 116 Wade River Road, Arkles Bay, Whangaparaoa 1463

ZL1BYQ Ashmore, R. W., 47 Shelly Beach Road, Ostend, Waiheke Island 1240
ZL1BYW Details unknown
ZL1BYY Cartwright, G. T., 6 Haycock Avenue, Mt Roskill, Auckland 1004
ZL1BYZ Shaw, John, Private Bag, Paerata, Pukekohe 1800
ZL1BZ Howitt, I. M., 15 Frederick Street, Otorohanga 2564
ZL1BZA Barnett, Z., 152 Eden Avenue, Te Awamutu 2400
ZL1BZC Ash, D. E., 51 Foster Avenue, Huia, Auckland 1007
ZL1BZF Nesfield, J. C., 4/10 Akehurst Avenue, New Lynn, Auckland 1007
ZL1BZI Newman, D. A., 112 The Avenue, Lynfield, Auckland 1004
ZL1BZJ Lodge-Osborn, D., Turanga Road, RD 1, Henderson, Auckland 1231
ZL1BZK Greenhill, D. R., 56 Oyster Drive, Cooks Beach, Whitianga 2850
ZL1BZL Ellis, D. G. R., 30 Alamein Avenue, Onerahi, Whangarei 0101
ZL1BZQ Galland, J. M. (Mrs), C/- 109 Norwood Road, Bayswater, Auckland 1309
ZL1BZS Chiswell, D. A., The Bullock Track, RD 3, Warkworth 1241
ZL1BZT Cawte, P. L., 332 Upper Harbour Drive, Greenhithe, Auckland 1311
ZL1BZW Rodger, T. R. R., Waipapa Block Road, RD 6, Tauranga 3021
ZL1BZZ Holmberg, R. E., RD 5, Tauranga 3021
ZL1CA Trebes, C. E., 11 Lamont Street, Hamilton 2001
ZL1CAA Harrison, E. C., 108 St. Patrick Row, Whangamata 2982
ZL1CAB Whittaker, Joyce, 4 Oak Place, Whakatane 3080
ZL1CAC Harsant, N. G., 105 Coronation Road, Hillcrest, Auckland 1310
ZL1CAD Francis, S. D., PO Box 9313, Newmarket, Auckland 1031
ZL1CAF Francis, M. E. (Mrs), PO Box 9313, Newmarket, Auckland 1031
ZL1CAG Bott, B., H5/28 Mattland Street, Greerton, Tauranga 3001
ZL1CAH Meyer, B. F. M., Barrett Road, RD 10, Hamilton 2021
ZL1CAK Miller, R. N., 106 Chadwick Road, Greerton, Tauranga 3001
ZL1CAL Badman, N. A., 17a Larch Street, Rotorua 3201
ZL1CAN Lonergan, O., 84 4th Avenue, Tauranga 3001
ZL1CAP Jones, L. R., 49 Vale Road, St Heliers, Auckland 1005
ZL1CAQ Gregory, J. H., 29 Ruawai Road, Mt Wellington, Auckland 1006
ZL1CAS Gates, N. L., 542 Whangaparaoa Road, Whangaparaoa, Auckland 1463
ZL1CAT Newland, P. J., PO Box 27-038, Mt Roskill, Auckland 1030
ZL1CAU Earnshaw, M. B., PO Box 100-862, North Shore Mail Centre, Auckland 1333
ZL1CAV Van Kuilenburg, Philippa, 45 Farrelly Avenue, Owariraka, Auckland 1004
ZL1CAX Laird, A. G., East Coast Road, RD 8, Nuhaka 4192
ZL1CAY Liddle, B. D., 3 Hinemotu Avenue, Kawerau 3075
ZL1CB Te Awamutu Amateur Radio Club, see Branch Directory
ZL1CBA De Ridder, L. J. (Mrs), PO Box 246, Kerikeri 0470
ZL1CBB Nortje, F. C., 308 Western Hills Drive, Whangarei 0101
ZL1CBD Wilson, I. A., 28 Butler Road, Kerikeri 0470
ZL1CBE Wright, W. A., Main North Road, RD 1, Awanui 0552
ZL1CBH Blake, J. R., 12 Sutton Close, Puriri Park Road, Maunu, Whangarei 0101
ZL1CBI Guilford, L. I., 2/35 Prospect Terrace, Milford, Auckland 1309
ZL1CBQ Contesse, L. C., 240 Kiripaka Road, PO Box 7085, Tikipunga, Whangarei 0133
ZL1CC Birt, D. J., 3 Cheeseman Place, Meadowbank, Auckland 1005
ZL1CCD Cumin, M. H., PO Box 429, Whangarei 0115
ZL1CCG Neil, H. P., 14 Bruce Place, Papatoetoe 1701
ZL1CCI Anderson, Jim, 46a Nen Street, Oamaru 8901
ZL1CCJ Goodenough, A. R., 754 East Coast Road, Browns Bay, Auckland 1311
ZL1CCL Amster, M. S., 23 Chamberlain Street, Feilding 5600
ZL1CCN Pearce, P. B., 7 Marvon Downs Avenue, Pakuranga, Auckland 1706
ZL1CCO Cogan, D. G., 50 Konini Road, One Tree Hill, Auckland 1005
ZL1CCP Davis, T. A., 224 Kirkwood Street, Thames 2801
ZL1CCT Raglan Amateur Radio Club, see Branch Directory
ZL1CCU Wanner, R. G., RD 2, Rukuhia Road, Ohaupo 2452
ZL1CCV Purves, P. S., 63a Tuhikaramea Road, Hamilton 2001
ZL1CCY Scutts, W. J., 509 Brown Street, Thames 2801
ZL1CDF Uren, P. E., 4 Frazer Street, Huntly 2191
ZL1CDJ Kitchen, D. H., Hart Road, RD 3, Hamilton 2021
ZL1CDM Roberts, D. F., 2/162a King Street, Whakatane 3080
ZL1CDN Burgess, B. W., PO Box 3007, Ohope 3085
ZL1CDQ Powell, G. W., 394 Belk Road, RD 1, Tauranga 3021
ZL1CDT Wilso, S. M. (Mrs), Parakao, PDC, Private Bag, Whangarei 0120
ZL1CDU O'Loughlin, B. G., Address unknown
ZL1CDV Brabant, G. C., 83 Riverside Drive, Whakatane 3080
ZL1CDW Keel, K. P., Stanley Road, RD 2, Opotiki 3092
ZL1CDX Fielding, T., 26 Roosevelt Road, Western Heights, Rotorua 3201
ZL1CDY Walker, R. G., PO Box 124, Kaitaia 0500
ZL1CE Wilson, G. R. S., 164 Ladies Mile, Ellerslie, Auckland 1005
ZL1CED Lee, Julian, 54 Lagoon Drive, Panmure, Auckland 1006
ZL1CEG Details unknown
ZL1CEJ Francis, W. D., PO Box 9313, Newmarket, Auckland 1031
ZL1CES Hooker, C. R., 8 Walker Street, Waihi 2981
ZL1CGA Kane, F. L. D., 8 Lancelot Road, Orewa, Auckland 1461
ZL1CGB Smith, B. J., 19 Fieldstone Court, Howick, Auckland 1705
ZL1CH Boyd, H. A., 13a Long Street, Torbay, Auckland 1311
ZL1CHM Gillen, S. M., 20 Orton Street, Glenfield, Auckland 1310
ZL1CI Meyer, T. R., 20 Marcel Place, Glenfield, Auckland 1310
ZL1CIM Details unknown
ZL1CJ Smith, B. W., Kimihia Road, RD 1, Huntly 2191
ZL1CJM McIsaac, C. J., Address unknown
ZL1CK Martin, E. T., 1 Queen Street, RD 1, Kopu, Thames 2821
ZL1CKM Details unknown
ZL1CL Leedom, C. A., 22 Windermere Crescent, Blockhouse Bay, Auckland 1007
ZL1CLE Riesterer, L. W., Apotu Road, RD 1, Kamo 0121
ZL1CLF Details unknown
ZL1CLG Caldwell, J., 44 Uxbridge Road, Howick, Auckland 1704
ZL1CLK Details unknown
ZL1CLS Details unknown
ZL1CM Prince, R. P., 79 Armstrong Road, Te Puna, RD 2, Tauranga 3021
ZL1CMA Ellwood, R., 13 Cross Street, Regent, Whangarei 0101
ZL1CMK Morrison, C. M. K., 63a Church Street, Devonport, Auckland 1309
ZL1CMR Rowlands, C. M., 6 Montague Place, Onerahi, Whangarei 0101
ZL1CN Woodfield, M. K., 72 Salamanca Road, Sunnynook, Auckland 1309
ZL1CNB Details unknown
ZL1COD Shearer, J. M., 1/57 Stanley Street, Taupo 2730
ZL1COR Trenkner, T. L., 72 Lillis Lane, Coromandel 2851
ZL1CP Clarke, R. W., Kaimaumau Road, RD 1, Awanui 0552
ZL1CPL Wiltshire, N. L., 42 Athenree Road, RD 1, Katikati 3063
ZL1CR Ngakuru, R. A. (Mrs), PO Box 278, Kaikohe 0400
ZL1CRO Aljinovic, S., PO Box 90-910, Auckland 1030
ZL1CS Shaw, C. E., PO Box 2088, Whakatane 3080
ZL1CSC Clayton, C. S., 6 Spinnaker Drive, Te Atatu Peninsula, Auckland 1008
ZL1CTI Bowman, M. S., 10 Puriri Street, Takapuna, Auckland 1309
ZL1CU Curtis, N. C., 9 Taraire Road, Titirangi, Auckland 1007
ZL1CUC Hobson, J., 20 Hobsonville Road, Massey, Auckland 1008
ZL1CUT Alexander, C. J. (Dr), 49 Richard Farrell Avenue, Remuera, Auckland 1005
ZL1CV Firman, R. J., 19 Tainui Street, Onerahi, Whangarei 0101
ZL1CVB Details unknown
ZL1CVK Wahrlich, Rowan, Whangamarino Road, RD 2, Te Kauwhata 2152
ZL1CW Hargraves, J. E., 7 Ostend Road, Surfdale, Waiheke Island 1240
ZL1CWD Cromarty, N. C., 20 Rautara Street, Orekei, Auckland 1005
ZL1CWN Pope, B. A., 9 Harbour Lights Terrace, RD 2, Whitianga 2856
ZL1CX Sykora, Peter, 3/165 Balmain Road, Birkenhead, Auckland 1310
ZL1CY Webster, D. M., 46 Speight Road, Kohimarama, Auckland 1005
ZL1CYK Stansfield, D., 3 Johnston Place, Welcome Bay, Tauranga 3001
ZL1CYX Edwards, W. H., 18 Shoebridge Crescent, Ngunguru 0240
ZL1CZ Duxbury, T. A., 3/57 Margan Avenue, New Lynn, Auckland 1007
ZL1DAA Beaumont, G. S., 6 Keyte Street, Whangarei 0101
ZL1DAB Williams, G. H., Taihoa Road, RD 4, Whangarei 0121
ZL1DAC Moates, C. M. G., S.H. Maungatapere, PO Box 102, Maungatapere 0240
ZL1DAD Swift, G. N., 25 Camellia Avenue, Ruakaka 0250
ZL1DAJ Cottle, J. N. (Mrs), Rainbow Falls Road, RD 2, Kerikeri 0470
ZL1DAQ Bradfield, D. S., 24 Selwyn Street, Blenheim 7301
ZL1DAS Werlberger, B., Miranda Road, RD 1, Pokeno 1872
ZL1DAV Reid, Dave, 47 Barrack Road, Mt Wellington, Auckland 1006
ZL1DAW Wakefield, I. C., 11 Tunui Place, Whakatane 3080
ZL1DBI Sheldon, Raewyn, 16 Carter Street, Mount Maunganui 3002
ZL1DBL Ralston, W. B., 168 Cambridge Road, Tauranga 3001
ZL1DC Rietz, B. A., 2b Stella Drive, Kerikeri 0470
ZL1DD Kirkwood, B. J., 66 Cory Road, Palm Beach, Waiheke Island 1240
ZL1DDL Gunther, U., 27a Temple Street, Meadowbank, Auckland 1005
ZL1DE Adshead, G. O., 35 Trevola Street, Avondale, Auckland 1007
ZL1DEF Hallmond, W. H., 24 Charlotte Street, Dargaville 0300
ZL1DF Thames Radio Club Branch 41 NZART (Inc), see Branch Directory
ZL1DG Marsh, B. G., 49 Tranmere Road, Hamilton 2001
ZL1DH Edwards, J. R., 2 Motuora Road, Manly, Whangaparaoa 1463
ZL1DI Logan, J. D., 17 Quona Avenue, Hillsborough, Auckland 1004

ZL1DIY Eckhoff, C., Post Office, Opua, Bay of Islands 0290
ZL1DJ Hopkins, B. N., 133 Kitchener Road, Waiuku 1852
ZL1DJB Details unknown
ZL1DJS Details unknown
ZL1DJT Taylor, D. J., 142 Welcome Bay Road, Tauranga 3001
ZL1DKM Macartney, D., 5 Anderson Street, Putaruru 2371
ZL1DL Birt, E., 41 Holland Road, Northcote, Auckland 1310
ZL1DLD Details unknown
ZL1DLE Portman, Ernie, 6 New Brighton Road, Otahuhu, Auckland 1006
ZL1DM Grayson, Rob, 25 Rembrandt Place, Papakura 1703
ZL1DMB Details unknown
ZL1DON Heta, D., 18 Wakefield Street, Wanganui East 5001
ZL1DQ Details unknown
ZL1DR Brooker, A. D., 35 Wordsworth Street, Leamington, Cambridge 2350
ZL1DRS Details unknown
ZL1DS Colquhoun, P. R., "Ulu" Estate, Far North Road, RD 4, Pukenui, Kaitaia 0500
ZL1DSP Pickles, D. S., 207 Clevedon-Takanini Road, Ardmore, Postal: PO Box 124, Clevedon, Auckland 1730
ZL1DT Rowe, E. G., 2/24 Cromdale Avenue, Howick 1705
ZL1DU Thomas, A. E., 23 Amethyst Place, Chartwell, Hamilton 2001
ZL1DV Veale, R. S. (Mrs), 31 Rangitoto Avenue, Remuera, Auckland 1005
ZL1DVB Van Beek, D. M., 16 High Street, Tirau 2372
ZL1DW Walpole, D. B., Cordyline Road, Port Waikato, RD 5, Tuakau 1892
ZL1DWB Details unknown
ZL1DX Melville, R. A., 33a Koromiko Street, New Lynn, Auckland 1007
ZL1DYC Heyer, H. L., 88 Brewster Road, RD 1, Tuakau 1892
ZL1FA Greenaway, A. W., 14 Lindoch Avenue, RD 2, Te Puna 3021
ZL1FAB Barrett, A. S., 50 Albert Street, Hamilton 2001
ZL1FB Bell, J. F. G., 34 Layton Road, Whangaparaoa 1463
ZL1FC Brott, R. O., Church Road, RD 2, Kaitaia 0500
ZL1FD Armstrong, D. K., Kaituna Road, RD 9, Te Puke 3071
ZL1FE Wilson, R. J., 25 May Street, Hillcrest, Hamilton 2001
ZL1FG Gilbert, W. S., 25 Bay View Road, Raglan 2051
ZL1FH Barkman, D. B., 903/45 Stanley Point Road, Devonport, Auckland 1309
ZL1FI Power, W. T., 100 Ranolf Street, Rotorua 3201
ZL1FK Challinor, M. J., 31 Barron Drive, Green Bay, Auckland 1007
ZL1FL Waterhouse, D. C., 854 No 1 Road, RD 2, Te Puke 3071
ZL1FMA Details unknown
ZL1FN Keesing, S., 68 Swann Beach Road, Whangaparaoa, Auckland 1463
ZL1FND Far North Districts Amateur Radio Club (Inc.), see Branch Directory
ZL1FON Nobbs, N. A., 85a Bayswater Avenue, Bayswater, Auckland 1309
ZL1FOX Sinclair, S. C., PO Box 789, Queenstown 9197
ZL1FR Wood, R. S., 5 Takitimu Street, Orakei, Auckland 1008
ZL1FS Miller, S. P., 47 Monarch Avenue, Hillcrest, Auckland 1310
ZL1FTL Lewis, F. T., 25 Marlin Drive, RD 1, Mangonui 0557
ZL1FU Hibiscus Coast Amateur Radio Club (Inc), see Branch Directory
ZL1FV Runciman, G. J. (Mrs), 36 Cardiff Road, Pakuranga, Auckland 1706
ZL1FW Rowe, Maxine, PO Box 4013, Mount Maunganui South 3030
ZL1FX Hyde, K. G., 126b Te Atatu Road, Te Atatu South, Auckland 1008
ZL1FY Armstrong, G. W., McIvor Road, RD 4, Whakatane 3080
ZL1FZ Coates, K. J., 2 Bardia Street, Takapuna, Auckland 1309
ZL1GA Hoy, M. H., 36 Sierra Street, Glendowie, Auckland 1005
ZL1GB Powell, D. B., Flat 10, 14-16 Mudie Street, Alicetown, Lower Hutt 6008
ZL1GBJ Jacobi, B. R., 8 Benella Street, Tokoroa 2392
ZL1GC Craig, G. H., 12 Exploration Way, Whitby, Wellington 6006
ZL1GD Details unknown
ZL1GDH Henley, G. D., 4 Carson Street, Tokoroa 2392
ZL1GE Manning, E., Lake Ngatu, RD 1, Awanui 0552
ZL1GF Fish, J. F., 14 Howard Road, Northcote, Auckland 1310
ZL1GG Cooper, G. V. (Ms), PO Box 330, Mangonui 0557
ZL1GI Brumby, C. J., 5 Matuhi Rise, Henderson, Auckland 1008
ZL1GJ Dobbing, S. J., 56 Pohutukawa Drive, Pukete, Hamilton 2001
ZL1GL Kelly, T. D., 35 Rawhitiroa Road, Kohimarama, Auckland 1005
ZL1GLO Duxfield, I. H. (Mrs), 12 Admiral Crescent, Hamilton 2001
ZL1GM Campin, J. W., 117b Golf Road, New Lynn, Auckland 1007
ZL1GN Beckham, D. S. R., 27 Fifth Avenue, Mt Albert, Auckland 1003
ZL1GO Details unknown
ZL1GP Henderson, R. J., 87 Grange Road, Mt Eden, Auckland 1003
ZL1GPS Shaw, P. J., 49 Mount View Road, Melville, Hamilton 2001
ZL1GQ Hardwick, D. B., 482 Period Road, RD 2, Matamata 2271
ZL1GR Goodwin, L., 43 Taupo Road, Taumarunui 2600
ZL1GRG Details unknown
ZL1GS Bell, G. T., 2a Curtis Street, PO Box 8127, Kensington, Whangarei 0130
ZL1GSG Storz, G., PO Box 109-700, Auckland 1031
ZL1GSN Nisbet, G. S., Address unknown
ZL1GT Hooker, B. N. N., 9 Amorino Drive, Hibiscus Coast, Orewa 1461
ZL1GTB Beagley, G. T., 24 Blomfield Street, Rotorua 3201
ZL1GU Rolfe, E. M., 9 Tait Street, Kamo, Whangarei 0101
ZL1GVP Details unknown
ZL1GYM Muzyka, G. Y., 33 Vermont Street, Ponsonby, Auckland 1001
ZL1GZ Graham, E. W., 18 Seaway Terrace, Tauranga 3001
ZL1HA Thompson, R. J., 64 Eban Avenue, Northcote, PO Box 33-442, Takapuna, Auckland 1332
ZL1HAM Hoete, N. C., PO Box 213, Kawerau 3075
ZL1HAU Hau, A. T., 10 Robin Hood Place, Onerahi, Whangarei 0101
ZL1HB Details unknown
ZL1HC Schoeman, S. J. O. (Dr), PO Box 195, Stratford 4700
ZL1HD Dahl, K. (Ms), Taratara Road, PO Box 36, Kaeo 0471
ZL1HE Lord, I. K., 41a Peninsula Club, 441 Whangaparaoa Road, Whangaparaoa 1463
ZL1HF Harrison, N. D., 42b Taikata Road, Te Atatu North, Auckland 1008
ZL1HG Grewal, H. (Mrs), 39a La Rosa Street, Green Bay, Auckland 1007
ZL1HH Cottle, D. J., Rainbow Falls Road, RD 2, Kerikeri 0470
ZL1HI Willis, M. W., Harpoon Hill, RD 1, Claris, Great Barrier Island 1236
ZL1HIT Rentoul, B. J., RD 1, Church Road, Kamo, Whangarei 0121
ZL1HJ Gannon, M., 9 Liverpool Street, Te Kuiti 2500
ZL1HK South Auckland Repeater Group (Branch 86), see Branch Directory
ZL1HL Carrel, J. L., 167 St Andrews Road, Epsom, Auckland 1003
ZL1HM Harvey, S. A., PO Box 2002, Rotorua 3215
ZL1HMS Detail unknown
ZL1HMT Tollenaar, H., 1/33 Argo Drive, Half Moon Bay, Auckland 1706
ZL1HN MacLaurin, P., 44 Taupo View Road, Taupo 2730
ZL1HO Sando, B. C., 1 Rahopara Street, Castor Bay, Auckland 1309
ZL1HQ Clarke, B. T., Private Bag 92-056, Great Barrier Island, Auckland 1236
ZL1HR Coles, J. P., 42 Hartford Avenue, Papamoa 3003
ZL1HS Carter, Carol, c/- 7 Matai Street, Ravensbourne, Dunedin 9002
ZL1HT Hardie, B. G. S., c/- Mrs C Paton, 1K RD, Oamaru 8921
ZL1HU Garton, W G, 48 Kingsford Drive, Stoke, Nelson 7001
ZL1HV Godfrey, A. G., 882 East Coast Road, Browns Bay, Auckland 1311
ZL1HW Dickinson, R., 135 Greenhithe Road, Greenhithe, Auckland 1311
ZL1HX Rutherford, N. J., 32 Kirrie Avenue, Te Atatu South, Auckland 1008
ZL1HY Edwards, Mike, 285 Main Road, Walton 2273
ZL1HZ Curtis, C. E., 5 Argyle Road, Browns Bay, Auckland 1311
ZL1IA Pivac, I. G., 4271 Great North Road, Henderson, Auckland 1008
ZL1IAG Details unknown
ZL1IAN Simpson, Ian, 65 Hilton Road, Rotorua 3201
ZL1IB Te Puke Branch NZART, see Branch Directory
ZL1IC Holdsworth, R., Sexton Road, RD 1, Hamilton 2021
ZL1ID Graham, N. L., 75 Campbell Road, Mount Maunganui 3002
ZL1IF Norling, L. E., PO Box 1266, Whangarei 0115
ZL1IG Monks, J., 2/9 Abelia Place, Papatoetoe, Auckland 1701
ZL1IH Intermann, R. H. D., 22 Hikutaia Road, Opotiki 3092
ZL1II Green, G. P. C., 248a Otipua Road, Timaru 8601
ZL1IJ Details unknown
ZL1IK Kelly, Iain, 2/25 Charlotte Street, Whangaparaoa 1463
ZL1IM Carter, E. W. A., 3 Haines Terrace, Te Kuiti 2500
ZL1IMP Pratt, I. M., 25 Smith Street, Raglan 2051
ZL1IN Pearce, R. M., 125 New Windsor Road, Avondale, Auckland 1007
ZL1IO McNamara, T. A., 32 Galileo Street, PO Box 8, Ngaruawahia 2171
ZL1IR Douglas, L. M., 29 Charles Crescent, Hamilton 2001
ZL1IS Waikato VHF Group, see Branch Directory
ZL1IT Hayman, G. L., 2/53 Hattaway Avenue, Bucklands Beach, Auckland 1704
ZL1IU Wallace, N. L., Signals Road, RD 1, Okaihau 0455
ZL1IV Irving, G. W., 50 Glass Road, Mt Roskill, Auckland 1004
ZL1IVO Pabbruwe, H. I., 99 Bradbury Road, Howick, Auckland 1705
ZL1IW Watson, I. B., Kohinui Road, RD 1, Parua Bay 0121
ZL1IX Taylor, W. R., 65a Butterworth Drive, Glendene, Auckland 1008
ZL1IY Cleland, D. E., 52 Alfred Street, Fairfield, Hamilton 2001
ZL1IZ Waitomo Radio Club, see Branch Directory
ZL1JA Berends, J. M., Address unknown
ZL1JAD Daley, J. A., 3 Yacht Place, Bucklands Beach, Auckland 1704
ZL1JAQ Goodenough, J. M., 754 East Coast Road, Browns Bay, Auckland 1311

ZL1JAW West, J. A., 4 Cradock Street, Avondale, Auckland 1007
ZL1JB Nalder, C. H., 291 Busby Road, RD 1, Katikati 3063
ZL1JBM Mulholland, James, Aid for the Bilnd, 10 Cameron Street, Fairfeld, Brisbane, Queensland 4101, Australia
ZL1JC Granger, P. L., 4 Trent Street, Avondale, Auckland 1007
ZL1JCB Slagter, J., PO Box 357, Whangarei 0115
ZL1JD Details unknown
ZL1JDL Hildreth, J. D. (Mrs), PO Box 292, Kumeu, Auckland 1250
ZL1JDW Henderson, R. R., 72 Chartwell Avenue, Auckland 1310
ZL1JE Blomfield, R. J., 5 Kent Street, Te Kuiti 2500
ZL1JF Finlay, P. T., 62 Woodside Road, Henderson, Auckland 1008
ZL1JFJ Johnson, J. F., 20 Golf View Road, Kerikeri 0470
ZL1JG Dent, R. E., c/- 3 Bush Road, Kelston, Auckland 1311
ZL1JJ Jackson, D., 67 Awaroa Road, Sunnyvale, Auckland 1008
ZL1JK Freeman, J. C., 6 Amante Crescent, Mairangi Bay, Auckland 1311
ZL1JKB Bell, J. K., 28 Seymour Avenue, Papatoetoe 1701
ZL1JKO Smith, J. W., F1/16a Whiteley Street, New Plymouth 4601
ZL1JKY Gould, A J, See overseas members G3JKY
ZL1JL Llewellyn, J. A., RD 2, Matakohe, S H 12, Northland 0584
ZL1JM McIntyre, J., 10 Banksia Dell, Mount Maunganui 3002
ZL1JN Turner, A., 140 Union Street, Howick 1703
ZL1JO Walker, N. A., 14 Mawney Road, Henderson, Auckland 1008
ZL1JOE Tilley, K. J., RD 2, Opotiki 3092
ZL1JON Bare, J. B., 6 Rose Place, Kamo, Whangarei 0101
ZL1JP Buckton, J. V., 14 Cockle Bay Road, Howick, Auckland 1704
ZL1JR Jones, J. W. W., 2/18 Meadowland Drive, Howick 1705
ZL1JRJ Jones, J. R., 12 Buchanan Street, PO Box 181, Opotiki 3092
ZL1JS Baker, M. R., Attwood Road, Tamaterau, RD 4, Whangarei 0121
ZL1JSS Smyth, J., Rotongaro Road, RD 2, Huntly 2191
ZL1JT Turnwald, J. B., 29 Cliff View Drive, Green Bay, Auckland 1007
ZL1JU Teviotdale, B. M., PO Box 7051, Te Ngae, Rotorua 3230
ZL1JV Details unknown
ZL1JW Paltridge, J. S., 3 Tutere Road, Papatoetoe 1701
ZL1JWD Dudbridge, J. W., 837a Whangaparoa Road, Whangaparoa 1463
ZL1JWF Details unknown
ZL1JZ Davison, P. W., PO Box 16, Waikino 2980
ZL1KA Addis, B. G., Clark Road, Karaka, RD 1, Papakura 1750
ZL1KAC McMurray-Cathcart, Kimberly, 38 Shelly Beach Road, Waiheke Island 1240
ZL1KAN Details unknown
ZL1KBY Details unknown
ZL1KC Page, A., 6 Matai Place, Otaki 5560
ZL1KD Fairweather, A. W., 69 Burwood Road, Matamata 2271
ZL1KE Details unknown
ZL1KF Cole, L. J., 22 Newcastle Road, Hamilton 2001
ZL1KG Ramsay, R. J., 2a King Street, Whangarei 0101
ZL1KH Turton, J. W., 461a Onehunga Mall, Onehunga, Auckland 1006
ZL1KI Horwood, E. W., 233 King Street, Whakatane 3080
ZL1KIV Kivell, G. J. (Dr), PO Box 145, Keri Keri, Bay of Islands 0470
ZL1KJ Cole, Gary J., 25 Matangi Terrace, Snells Beach, Warkworth 1241
ZL1KL Cooper, H. G. T., 34 Omokoroa Road, Omokoroa 3021
ZL1KLB Details unknown
ZL1KO Ross, M. O., RD 1, Katikati 3063
ZL1KOB Rasmussen, E. C., C/- Whakatane Motor Camp, McGarvey Road, Whakatane 3080
ZL1KP Burgess, A. Bruce, 4 Killarney Street, Te Puke 3071
ZL1KQ Small, J., 32 Paddington Street, Glen Innes, Auckland 1006
ZL1KR Kleyburg, A., 12 Cherrywood Street, Hamilton 2001
ZL1KRH Hampshire, K. R., 5 Sapphire Drive, Springfield, Tauranga 3001
ZL1KS Smith, K., 2 Philomel Crescent, Baswater, Auckland 1309
ZL1KSB Bennett, S. J., 39 Addington Avenue, Manurewa, Auckland 1702
ZL1KSS Spence, K. S., 1 Kaharoa Avenue, Omokoroa, Tauranga 3021
ZL1KT Teviotdale, D. A., PO Box 7051, Te Ngae, Rotorua 3230
ZL1KTM Haldane, John, Burnside, Jericho Road, RD 2, Pukekohe 1800
ZL1KV Pooley, E. A., 2 Ayr Street, Waihi Beach 2980
ZL1KW Kawerau Amateur Radio and Hobbies Club, see Branch Directory
ZL1KX Walford, K. W., 354 Somme Parade, Aramoho, Wanganui 5001
ZL1KY West, G. J., 12 Surf Road, Whangaparaoa 1463
ZL1KZ Ellery, H. F., 26 Catalina Crescent, Takapuna, Auckland 1309
ZL1LA Anderson, L. J., 19a Tui Glen Road, Birkenhead, Auckland 1310
ZL1LAT Sylvester, R. L., 19 Ringwood Street, Torbay, Auckland 1311
ZL1LB Details unknown
ZL1LC Bird, W. A., 239 Nelson Street, Invercargill 9501
ZL1LD Williams, Pat, 144 Titirangi Road, New Lynn, Auckland 1007
ZL1LE Egan, B., 12 Island View Terrace, Howick, Auckland 1704
ZL1LEF Leef, R., 69 Park Avenue, Whangarei 0101
ZL1LES Savage, L. W., 99 Taupo View Road, Taupo 2730
ZL1LF Elder, J. W., PO Box 75, Temuka 8752
ZL1LFA Atkinson, L. F., Kaimaumau Road, 1 RD, Awanui 0552
ZL1LG Woodfield, Laurice (Mrs), 72 Salamanca Road, Sunnynook, Auckland 1309
ZL1LH Cowie, D. J., 124 Albany Heights Road, Albany, Auckland 1311
ZL1LI Hughes, P. D. P., 17 Oscar Road, Greenhithe, Auckland 1311
ZL1LIA Hutley, D. A., 5 Westbourne Road, Remuera, Auckland 1005
ZL1LIN Marr, L. J. (Mrs), 27 Houhere Place, Tikipunga, Whangarei 0101
ZL1LJ Scutts, L. J., c/- 509 Brown Street, Thames 2801
ZL1LK Sargon, R. P., 2a Enderby Drive, Te Atatu North, Auckland 1008
ZL1LM Marsden, A. N., 9 Wanaka Place, Pakuranga, Auckland 1706
ZL1LN Simmons, A. L., 69 Roberts Avenue, Bayswater, Auckland 1309
ZL1LO Robinson, I., 40 Masterton Road, Rothesay Bay, Auckland 1311
ZL1LP Parsons, E. R., 509/1 Mutu Street, Te Awamutu 2400
ZL1LR Anderson, P. C., 32 Gilmour Street, Waihi 2981
ZL1LS McTurk, Andrew, 40 Silverton Road, Waihi 2981
ZL1LT Malcomson, Merv, 413 Fraser Street, Tauranga 3001
ZL1LU Heslop, W. T., 19 Corinna Street, Welcome Bay, Tauranga 3001
ZL1LWC Chandler, L. W., 158a Waihi Road, Judea, Tauranga 3001
ZL1LWR Details unknown
ZL1LY Brown, K. L., 38 Thompson Street, Tokoroa 2392
ZL1LZ Dunwoody, M. L., 126 Bridgeman Road, Te Awamutu 2400
ZL1MA Gibbons, A., 27 Lisa Rise, Bucklands Beach, Auckland 1706
ZL1MAC McPike, B. G., 1/3 Bardia Street, Belmont, Auckland 1309
ZL1MAX Clear, M. R., Limmer Road, RD 8, Te Kowhai, Frankton 2030
ZL1MBB Mercury Bay Branch 85, see Branch Directory
ZL1MC Hume, S. T., 61 Egmont Street, Ohauiti, Tauranga 3001
ZL1MCC Manukau Civil Defence HQ, c/- Manukau City Council, Attn M. Lowry, Private Bag, Manukau City 1730
ZL1MCK McKechenie, W. E., 77 Taikata Road, Te Atatu North, Auckland 1008
ZL1MD McLellan, A. D., 11 Waitawa Place, Rotorua 3201
ZL1MDS Digby-Smith, M. P., 6 Baird Avenue, Te Kauwhata 2152
ZL1ME Geard, M., 1/30a Walter Street, Takapuna, Auckland 1309
ZL1MF Crabtree, J. A., PO Box 172, Katikati 3063
ZL1MFW Details unknown
ZL1MG Bretherton, Ted, 24 Iles Road, Rotorua 3201
ZL1MGB Kenworthy, T. C., 15 Commissariat Road, Mt Wellington, Auckland 1006
ZL1MH Hutchins, M. G. D., PO Box 581, Kaikohe 0400
ZL1MI Warriner, A. D., c/- OSMU, RNZAF Base, Auckland Private Bag, Whenuapai 1020
ZL1MIN Lo, M. (Miss), PO Box 76-481, Manukau City, Auckland 1730
ZL1MJ Schwass, B. R., 24 Mokorua Grove, Whakatane 3080
ZL1MJH Details unknown
ZL1MK Spackman, D. G., 27 Dekker Road, Pyes Pa, RD 3, Tauranga 3021
ZL1MLO Details unknown
ZL1MM Garde-Browne, M., Bowemtown Road, Athenvee, RD 2, Katikati 3063
ZL1MN Nisbet, D. I., 4 Williams Avenue, Kaikohe 0400
ZL1MO Spackman, I. H., 124c Taylor Street, Blockhouse Bay, Auckland 1007
ZL1MP Poulton, G. G., 7 Rickards Place, New Lynn, Auckland 1007
ZL1MQ Davidson, Bruce, 70 Onerahi Road, Onerahi, Whangarei 0101
ZL1MR Wilkins, D. F., PO Box 117, Papakura, Auckland 1730
ZL1MRX Fuller, J., 26 Sunshine Road, Taumarunui 2600
ZL1MS Inder, J. H., 19 Rushton Avenue, Otumoetai, Tauranga 3001
ZL1MST Paton, J. S., 1 Tamariki Avenue, Kelston, Auckland 1007
ZL1MT Minchin, H. E., Main Road, RD 1, Arapuni, Via Putaruru 2370
ZL1MU Crooks, D. M., 13 Burrows Avenue, Karori, Wellington 6005
ZL1MUA Details unknown
ZL1MV Garrard, R. C., Address unknown
ZL1MW Huggard, B. F., 12 McClintock Road, Massey, Auckland 1008
ZL1MX Currie, D. J., 127 Ridge Road, Howick 1705
ZL1NA Wilson, G. D., 1 Mt Roskill Road, Mt Roskill, Auckland 1004
ZL1NAK Knapper, G. J., 1/51 Waitangi Road, Onehunga, Auckland 1006
ZL1NAW Byrnes, J. L., 14 Sunset Crescent, Tauranga 3001
ZL1NB Hitch, G. W., Rawhiti Road, RD 4, Hikurangi 0251
ZL1NBS Sturmey, Neil, 42 Alton Avenue, Northcote, Auckland 1310

ZL1NF Garrett, R., 13 Rock Isle Road, Torbay, Auckland 1311
ZL1NG Muller, J., 1/7 Newhaven Terrace, Mairangi Bay, Auckland 1311
ZL1NH White, N. R., 33 Norton Road, Otumoetai, Tauranga 3001
ZL1NHQ Wardell, G. A., 112 Manaia Street, Tokoroa 2392
ZL1NJ Ecclesfield, B. D., 43 Maihi Crescent, Tauranga 3001
ZL1NJZ Davison, P. J., PO Box 16, Waikino 2980
ZL1NK Mander, N. K., 38 Arundel Street, Mt Roskill, Auckland 1004
ZL1NKM Kane, M. (Mrs), 8 Lancelot Road, Orewa 1461
ZL1NM Mee, Nigel, Private Bag, Orere Point, Papakura 1730
ZL1NN Douglas, J. W., The Palms, 15 Puriri Road, Orewa 1461
ZL1NP Peart, L. C., 15 Tole Street, Ponsonby, Auckland 1001
ZL1NQ Barrell, S. J., PO Box 7036, Tikipunga, Whangarei 0133
ZL1NS Hickey, John, PO Box 135, Neiafu, Kingdom of Tonga
ZL1NT Hill, B. J., PO Box 804, Hamilton 2015
ZL1NTF Hall, T. F., Happy Valley Road, RD 3, Te Awamutu 2400
ZL1NU Griffiths, K. B., 64 Arawa Street, New Lynn, Auckland 1007
ZL1NUB Bullen, V. W. (Mrs), 32 Otumoetai Road, Tauranga 3001
ZL1NV Jackson, B. T., Albany Heights Road, RD 2, Albany 1311
ZL1NW Goldfinch, R. Q., 4 Tukes Place, Greenmeadows, Napier 4001
ZL1NX Baveystock, S. C., 2 Fraser Street, Tauranga 3001
ZL1NY Orr, N. A., 2/34 Prospect Terrace, Milford, PO Box 31-433, Milford 1330
ZL1NZ Blyde, J. V., 43 Wolsbley Road, RD 1, Katikati 3063
ZL1OA Steegstra, R., PO Box 10-185, Te Mai, Whangarei 0130
ZL1OB Booth, O. R., 40a Esk Street, Tauranga 3001
ZL1OC Shaw, Vicki, PO Box 2088, Whakatane 3080
ZL1OD Wallace, J. A. L., PO Box 1226, Gisborne 3815
ZL1OF Wapp, A., 14 Country Club Lane, Waiuku 1852
ZL1OG Gabbie, O. J., FEBC, PO Box 209, Saipan MP-96950
ZL1OH Fairhead, A. D., The Eyrie, RD 4, Papakura 1730
ZL1OI Bourne, H. K., Unit 85 Metlifecare Pakuranga Ltd, Edgewater Drive, Pakuranga 1706
ZL1OJ Dowling, H. J., 52 Aurora Terrace, Hillcrest, Hamilton 2001
ZL1OK Fuller, Anna (Mrs), 26 Sunshine Road, Taumarunui 2600
ZL1OM Windsor, K. W., 36 Chatswood Grove, Birkenhead, Auckland 1310
ZL1ON Eglinton, G. K., 47a Ridge Road, Otumoetai, Tauranga 3001
ZL1ONE Lake, J. R. (Ms), 138 Wellington Street, Opotiki 3092
ZL1OO Dreaver, B. G. W., 5 Essex Street, Te Atatu South, Auckland 1008
ZL1OPA Verhoef, W. C. M., 22b Santa Monica Place, Manukau City, Auckland 1702
ZL1OR Mullions, R. E., 35 Riverview Road, Morrinsville 2251
ZL1OS Osborne, B. A. (Mrs), 34 Cobham Drive, Kawerau 3075
ZL1OT Evans, R. J., PO Box 175, Kaeo 0471
ZL1OTR Revington, O. T., 47a Manawatu Street, Hokowhitu, Palmerston North 5301
ZL1OV Kirton, F. N., 1/12 Stewart Gibson Place, Manurewa 1702
ZL1OVY Hartley, K. D., 29 Cliff Road, Torbay, North Shore City 1311
ZL1OW Burrows, J. W. L., c/- Post Office, Greerton, Tauranga 3030
ZL1OX Crawley, H. V., 5/238 Onewa Road, Birkenhead, Auckland, PO Box 34-075, Birkenhead 1330
ZL1OY Mudford, K. H., 94 Burwood Road, Matamata 2271
ZL1OZ Skinner, B. J., 12a Anna Place, Taupo 2730
ZL1PAL Details unknown
ZL1PAM Blackett, P. H., 56 Church Street, Northcote, Auckland 1310
ZL1PB Brown, P., 5-9 Duke Street, Putaruru 2371
ZL1PC Slako, P. W., Oakleigh, RD 1, Whangarei 0121
ZL1PD Ede, A. F., 136 Colville Road, RD 7, Dargaville 0300
ZL1PDR Details unknown
ZL1PE Erceg, P. J., 8 Lake Ora Road, Three Mile Bush Road, Kamo, Whangarei 0121
ZL1PG Morgan, J. A., 38 Dreadon Road, Manurewa 1702
ZL1PH Yates, Cathy, Linwood Road, Karaka, RD 1, Papakura 1730
ZL1PI McDonald, A. K., 17 The Glebe, Coastlands, Whakatane 3080
ZL1PJ Dare, P. H., 28a Wharenui Road, Rotorua 3201
ZL1PJC Details unknown
ZL1PK King, P. D., 11 Salmond Place, Hamilton, PO Box 126, Waikato Mail Centre 2015
ZL1PKT Details unknown
ZL1PL Grise, M. J., 121 James Street, Postal: PO Box 73, Coromandel 2851
ZL1PM Perfect, J. J., 8 Otuhiwai Crescent, Tikipunga, Whangarei 0101
ZL1PP Dekker, P., 118 Albany Heights Road, RD 2, Albany 1311
ZL1PS Brown, T. G., 2 Hilstan Place, Onehunga, Auckland 1006
ZL1PT Twiss, D. P. L., 35 Rimu Street, Tauranga 3001
ZL1PWS Savage, P. W., 99 Taupo View Road, Taupo 2730
ZL1PX Martin, H. L., 25 Cockayne Crescent, Sunnynook, Auckland 1309
ZL1PZ Sexton, I. M., 10 Fair Oaks, Pukekohe 1800
ZL1QB Manukau Radio Club (Inc), see Branch Directory
ZL1QF Foreman, Q. S., PO Box 7400, Wellesley Street, Auckland 1036
ZL1QG Morris, D. C., 5 Woodside Road, Henderson, Auckland 1008
ZL1QH Cooke, S. R., 11 Ashlynne Avenue, Papatoetoe, Auckland 1701
ZL1QI Gillett, P. A., PO Box 3074, Greerton, Tauranga 3030
ZL1QK Stone, Bill, 5 Winslowe Place, Papakura 1703
ZL1QL Borck, Laurie, 28 Denby Crescent, Tikipunga, Whangarei 0101
ZL1QM Ockleston, G. W., 17 Bracken Avenue, Epsom, Auckland 1003
ZL1QO Elowsson, B. W., 9 Sanctuary Point, Pakuranga 1706
ZL1QP Redan, J. E., 27 Moehau Street, Te Puke 3071
ZL1QQ Shaw, A. A., PO Box 5461, Lambton Quay, Wellington 6040
ZL1QT Morris, P. S., 13 Ransom Smyth Drive, Manukau City, Auckland 1702
ZL1QW Waihi Branch NZART (Inc), see Branch Directory
ZL1QY Williams, R. G., 67a Botanical Road, Tauranga 3001
ZL1RA Swain, R. A., 314 Ongare Point Road, Ongare Point, RD 1, Katikati 3063
ZL1RAD Details unknown
ZL1RAF Farrant, R. A., 1/27 Holland Road, Glenfield, Auckland 1310
ZL1RAH Hansen, R. A., 210 Shirley Road, Papatoetoe, Auckland 1701
ZL1RAL Details unknown
ZL1RAW Williams, R. A., 47 Arthur Street, Ellerslie, Auckland 1005
ZL1RAY Kendall, R. D., 86 Haukore Street, Tauranga 3001
ZL1RB Boggiss, R. J., PO Box 152, Waihi 2981
ZL1RCA Sangster, I. W., 75 Anawhata Road, Piha, RD, Auckland 1250
ZL1RD Leinwand, Rob, 73 Tender Road, Dairy Flat, RD 4, Albany, Auckland 1311
ZL1RF Matamata Amateur Radio Club, see Branch Directory
ZL1RG Jones, M. N., 96 Russell Road, Huntly 2191
ZL1RGR Rowe, R. G., 32 Manawa Road, Remuera, Auckland 1005
ZL1RH Tanaka, J, c/- ZL4HU, PO Box 7, Clyde, Central Otago 9180
ZL1RJ Jarlov, R. W. E., 85 Mallard Drive, Rotorua 3201
ZL1RK Details unknown
ZL1RL Langridge, R. A., 16 Jellicoe Street, Whangarei 0101
ZL1RM Jeffs, J. F. C., c/- 80 Totara Drive, Pukete, Hamilton 2001
ZL1RN Lewis, K. J., 168 Ellis Street, Frankton, Hamilton 2001
ZL1RNF Francis, R. N., 4 Essex Street, Henderson, Auckland 1008
ZL1ROB Details unknown
ZL1ROD Details unknown
ZL1RON Miller, R. P., 49 Beach Road, Parua Bay, RD 4, Whangarei 0121
ZL1ROT Rotorua Amateur Radio Club, see Branch Directory
ZL1RR Ryan, D. F., 129 Cook Street, Howick 1705
ZL1RRV Harvey, R. F., 33 Birdwood Avenue, Papatoetoe 1701
ZL1RS Sutton, R. J., 109 Wright Road, RD 2, Katikati 3063
ZL1RSE Eyre, R. S., 1 Woodhill Close, Whangarei 0101
ZL1RT Maginnity, D., 7 Kentucky Crescent, Nawton, Hamilton 2001
ZL1RU Gooch, G. M., 21 Jeffreys Road, Fendalton, Christchurch 8005
ZL1RUA Todd, R. T., Private Bag 932, Kawau Island 1241
ZL1RVR Voorburgh, R., PO Box 36, Mangawhai 0583
ZL1RW Wilson, R. M., "Longwood" Anderson Road, RD 5, Warkworth 1241
ZL1RWB Barraud, R. W., 85 Target Road, Glenfield, Auckland 1309
ZL1RWJ Johnson, R. W., 8 Graham Street, PO Box 33, Te Kopuru 0356
ZL1RWM McNamara, R. W., PO Box 429, Opotiki 3092
ZL1RX Wighton, G. M., 52 Ainsworth Road, c/- Post Office, Bethlehem 3001
ZL1RY Shimmin, R. L., 130 Union Road, Howick, Auckland 1705
ZL1RZ Johnstone, A. R., 74 Waimumu Road, Massey, Auckland 1008
ZL1SA Franklin Branch NZART (Inc), see Branch Directory
ZL1SB Sapich, S., 148 Forest Hill Road, Henderson, Auckland 1008
ZL1SC Corrigan, M. L., PO Box 40-135, Glenfield, Auckland 1330
ZL1SCD Details unknown
ZL1SD Colquhoun, R. D., 32 Valley Road, Mt Eden, Auckland 1003
ZL1SDD Details unknown
ZL1SEA Details unknown
ZL1SG Cowie, C. A., 21 Stratford Drive, Cable Bay, Mangonui 0557
ZL1SH Adair, M. W., 41 Seavista Avenue, Birkdale, Auckland 1310
ZL1SHF Details unknown
ZL1SJ Holmes, G. C., PO Box 82-043, Highland Park, Auckland 1730
ZL1SK Thomas, M. R., 52 Bollard Avenue, Avondale, Auckland 1003
ZL1SKC Saint Kentigern College, PO Box 51-060, Pakuranga 1730
ZL1SKF Faupel, Stephen, 32 Howe Street, Howick, Auckland 1705
ZL1SL Biddick, P. N., 11 Flinders Place, Tauranga 3001
ZL1SLO Dunatov, F., 80 Shaw Road, Oratia, Auckland 1007
ZL1SN Details unknown
ZL1SNA Details unknown
ZL1SO Miller, R. L., 52 Hinekura Avenue, Taupo 2730
ZL1SP Bain, Fred, 58 George Crescent, Buckland, RD 2, Pukekohe 1800
ZL1SQ Van Den Heuvel, T., 9 Laing Place, Otumoetai, Tauranga 3001
ZL1SR Coppell, B. L., 128a James Street, Whakatane 3080

ZL1SS Skellon, D. B., 36 Mountbatten Avenue, Glenfield, Auckland 1310
ZL1ST Smith, N. E., 3 Ward Crescent, Te Atatu, Auckland 1008
ZL1SV Perkins, J. A., 2 Ponui Place, Mairangi Bay, Auckland 1311
ZL1SVD Duoba, S. V., 36 Karaka Road, Waiheke Island, Auckland 1240
ZL1SW Wright, A. T., Toka Toka Road, RD 2, Toka Toka, Ruawai 0586
ZL1SX Kirkham, A. L., 38 Waller Avenue, Bucklands Beach 1704
ZL1SY Thompson, Murray G., 13 McDowell Street, Rotorua 3201
ZL1SZ Evans, M. J., 14 Henderson Street, Whakatane 3080
ZL1TA Mortensen, N. R., 16 Melrose Road, Hillsborough, Auckland 1004
ZL1TAC Ramsay, D. J., Address unknown
ZL1TAD Doar, T. A., 49b Peach Road, Glenfield, Auckland 1310
ZL1TAE Ristic, A. T., Buckland Road, RD 4, Tuakau 1892
ZL1TAF Anderson, Anne, 32 Gilmour Street, Waihi 2981
ZL1TAG Plimley, A. E., 104 Porawai Road, Thames 2801
ZL1TAI McBurney, R. T., 25 Hamilton Road, Papatoetoe 1701
ZL1TAJ Ellis, N. M., PO Box 1020, Tauranga 3015
ZL1TAK Sergent, P. A., 20 Marie Avenue, Te Atatu South, Auckland 1004
ZL1TAL Burrage, D. A., 87 Kauri Point Road, Laingholm, Auckland 1007
ZL1TAN O'Callaghan, D. R., Private Bag 93-211, Parnell, Auckland 1033
ZL1TAO Kimber, W. C., 50 Main Road, Titahi Bay, Wellington 6006
ZL1TAR Wilkinson, R. N., 19 Island Bay Road, Beachhaven, Auckland 1310
ZL1TAT Brown, I. W., 35 Lancaster Street, Hamilton 2001
ZL1TAU Coghlan, P. R., 18 Essex Street, Te Atatu South, Auckland 1008
ZL1TAX Details unknown
ZL1TAY Thornton, D., 12 Rahui Road, Greenhithe, Auckland 1311
ZL1TAZ Purdy, G. N., 36a Pleasant Road, Glen Eden, Auckland 1007
ZL1TB Howick and District Branch NZART (Inc), see Branch Directory
ZL1TBB Carter, R., 1218 Huia Road, Huia, Auckland 1007
ZL1TBC Details unknown
ZL1TBE Essipov, B., Meadow Court Motel, Papatoetoe, Postal: PO Box 23-001,Hunters Corner, Auckland 1730
ZL1TBG Sanson, R. G., 55 Bertram Street, Warkworth 1241
ZL1TBI Details unknown
ZL1TBK Details unknown
ZL1TBM Details unknown
ZL1TBN Sanders, P., Newells Road, RD 3, Hamilton 2021
ZL1TBO Details unknown
ZL1TBP Croll, D., 25 Pouwhare Street, Whakatane 3080
ZL1TBQ Angell, A. R., 49b Crane Street, Mount Maunganui 3002
ZL1TBS Smith, L. J., 123 Sandspit Road, Howick, Auckland 1706
ZL1TBV Russ, G. M. (Miss), 73 Pine Street, Belmoral, Auckland 1004
ZL1TBW Winger, B. S., PO Box 1532, Whangarei 0115
ZL1TBX Bott, A. D., PO Box 11-056, Ellerslie, Auckland 1131
ZL1TBY Seccombe, J. G., Oaklands Road, RD 1, Papakura 1730
ZL1TBZ Tatton, W. C., 7 Realm Place, Massey, Auckland 1008
ZL1TC Metcalfe, A. D., Address unknown
ZL1TCC Topper, K. K., 11 Edith Place, Hamilton 2001
ZL1TCD Details unknown
ZL1TCE Nation, D. L., 54 Prisk Street, Hamilton 2001
ZL1TCF Fortune, T. La T., 129a Bleakhouse Road, Howick 1704
ZL1TCI Grange, D. L., PO Box 80-026, Green Bay, Auckland 1230
ZL1TCJ Jackson, L. H., 5 Ripon Crescent, Meadowbank, Auckland 1005
ZL1TCK Woolley, M. G., 5a Springbank Lane, Te Atatu North, Auckland 1008
ZL1TCN Herbert, E. R., 13a Didsbury Drive, Waihi Beach 2980
ZL1TCO Tapp, A. J., PO Box 1669, Whangarei 0115
ZL1TCP Mattler, J. L., 25 Seddon Street, Te Kuiti 2500
ZL1TCR Bell, K. G., 174 Carnoustie Drive, Wattle Downs, Manurewa, Auckland 1702
ZL1TCS Billing, C. I. (Mrs), 2 Norfolk Terrace, Whangaparaoa, Auckland 1463
ZL1TCU Legg, M. E., 11 Belle Verde Drive, Mairangi Bay, Auckland 1311
ZL1TCX Taylor, A. J., 56 Mayfair Crescent, Mairangi Bay, Auckland 1311
ZL1TCZ Turnwald, F. L. (Mrs), 29 Cliff View Drive, Green Bay, Auckland 1007
ZL1TDA Shackleton, R. D., 17 George Street, Kingsland, Auckland 1003
ZL1TDB Raffles, Margaret, 54 Rockfield Road, Ellerslie, Auckland 1006
ZL1TDC Purves, G. S., 480 Cambridge Road, Te Awamutu 2400
ZL1TDE Davis, W. L., 48 Chatsworth Crescent, Pakuranga, Auckland 1706
ZL1TDG Morris, V., 116 Union Road, Howick, Auckland 1705
ZL1TDH Dunsbee, B. L., Gun Club Road, RD 1, Pukekohe 1800
ZL1TDI Lee, C. P., 117 Chelsea View Drive, Birkenhead, Auckland 1310
ZL1TDJ Burton, R. D., 11 Henderson Valley Road, Henderson, Auckland 1008
ZL1TDK Fitzpatrick, D. J., Flat 2 17 May Street, Hillcrest, Hamilton 2001
ZL1TDL Littin, A. C., Maeneene Road, RD 5, Wellsford 1242
ZL1TDQ Woodfield, Dave, 39 Aliford Avenue, One Tree Hill, Auckland 1006
ZL1TDR Harding, B. D., 25 Meadowcroft Grove, Johnsonville, Wellington 6004
ZL1TDU Allan, P. K., 12 High Street, Whangarei 0101
ZL1TDV Penwarden, E. C., 13 Kupe Place, Tokoroa 2392
ZL1TDW Bullough, E. G., 20 Coldham Crescent, Meadowbank, Auckland 1005
ZL1TDX Turnball, G. R. H., 159 Bucklands Beach Road, Bucklands Beach 1704
ZL1TDZ Miller, C. J., 13a Omahu Road, Remuera, Postal: PO Box 128-152, Remuera, Auckland 1136
ZL1TE Lynneberg, R., 7 Beach Haven Place, Paraparaumu Beach 6010
ZL1TEA Morton, K. W., 41 Aroha View Avenue, Te Aroha 2971
ZL1TEE Details unknown
ZL1TEK Details unknown
ZL1TEM Gulliver, Edith, 43a Te Ahuahu Road, RD 2, Piha, Auckland 1250
ZL1TEO Grossman, R. W., PO Box 80 080, Green Bay, Auckland 1230
ZL1TEP Rankin, D. J., PO Box 12-557, Penrose, Auckland 1135
ZL1TER Details unknown
ZL1TES Bruce, K. W., 37 Japonica Drive, Birkdale, Auckland 1310
ZL1TEV Barnett, D. S., 16 Pembroke Street, Moerewa 0292
ZL1TEY McDonald, M. S., 52 Cargill Street, Papakura 1703
ZL1TEZ Details unknown
ZL1TF Morrison, I. McG., 183 The Sycamores, Milton, Cambridge, UK CB46ZH
ZL1TFA Schwarz, B. A., 6 Leeds Street, Hamilton 2001
ZL1TFB Cooper, S. W., 41a Kelvin Road, Papakura 1703
ZL1TFC Godfrey, J. P., 15 Crompton Road, Massey, Auckland 1008
ZL1TFD Iversen, R. J., 1/3 Akehurst Avenue, New Lynn, Auckland 1007
ZL1TFG Ballantyne, D. L., Bush Road, Albany, PO Box 28, Albany Village 1330
ZL1TFH Swift, D. M., 42 Sherwood Road, Onerahi, Whangarei 0101
ZL1TFJ Enersen, F. J. C., 20 Brookfield Terrace, Otumoetai, Tauranga 3001
ZL1TFL Hawkes, R. G., 26 Penzance Road, Mairangi Bay, Auckland 1311
ZL1TFO Baine, C. J., Main Road, PO Box 1, Broadwood 0571
ZL1TFP Purdy, R. G., 41 John Davis Road, Mt Roskill, Auckland 1004
ZL1TFQ Details unknown
ZL1TFR Sturm, F. R., RD 8, Mahia Beach 4192
ZL1TFS Fitzpatrick, Hilary, Lake Rotoma, RD 4, Rotorua 3221
ZL1TFW Savage, J., 151 Valley Road, Henderson, Auckland 1007
ZL1TFX Rowe, R. A., 422 Thames Street, Morrinsville 2251
ZL1TFY Details unknown
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ZL1VSG Gurr, S. R. (Miss), 3 Brightside Road, Stanmore Bay, Whangaparaoa 1463
ZL1VSJ Scheffer, J. A., 103 Manuka Road, Glenfield, Auckland 1310
ZL1VST Woodfield, Kelly, 9a Rewi Road, Royal Oak, Auckland 1003
ZL1VTC Cron, Trish, 31 Kakanui Avenue, Hamilton 2001
ZL1VTF Details unknown
ZL1VTY Details unknown
ZL1VU McIsaac, A. J., 26 Ferry Parade, Herald Island, Auckland 1008
ZL1VUA Details unknown
ZL1VV Details unknown
ZL1VWM Details unknown
ZL1VX Boyd, R., 14 Dundas Street, Whitianga 2856
ZL1VXH Hedayati, S., 7/16 Knight Avenue, Mt Albert, Auckland 1003
ZL1VY Details unknown
ZL1VZ Frieberg, A. G., Unit 2, 15 John Davis Road, Mt Roskill, Auckland 1004
ZL1WA Wills, Alma, 14a Graham Street, Pukekohe 1800
ZL1WAA Details unknown
ZL1WAG Neill, L. M. (Miss), 10 Peter Buck Road, Avondale, Auckland 1007
ZL1WAJ Details unknown
ZL1WAM McGrath, A., 73 Eban Avenue, Northcote, Auckland 1310
ZL1WAR Walsh, D. A. (Ms), Maungatapu Road, RD 1, Morrinsville 2251
ZL1WAT Percival, M. D., 32 Tammadge Street, Te Kuiti 2500
ZL1WAY Details unknown
ZL1WB Rowlings, B. H., 22 Tainui Street, Onerahi, Whangarei 0101
ZL1WBH Herlihy, B., 20 Kea Place, Tokoroa 2392
ZL1WBZ Details unknown
ZL1WCJ Johnson, C. A. (Mrs), PO Box 60 202, Titirangi, Auckland 1230
ZL1WCR Details unknown
ZL1WDA Dalley, P. R., PO Box 14-195, Panmure, Auckland 1134
ZL1WDC Cobussen, D. G., 1/123 Mt Albert Road, Mt Albert, Auckland 1001
ZL1WDE Details unknown
ZL1WDH Details unknown
ZL1WDS Strong, D. G., PO Box 184, Warkworth 1241
ZL1WDZ Ziegler, D. A., 21 Elsted Place, Goodwood Heights, Manakau, Auckland 1702
ZL1WE Edlin, Wally, PO Box 495, Papakura 1730
ZL1WEN Details unknown
ZL1WEQ Details unknown
ZL1WER Details unknown
ZL1WET Jackson, A. D., 4 Woodward Street, Hamilton 2001
ZL1WF McNae, G. S., 74b Cairnfield Road, Whangarei 0101
ZL1WFA Details unknown
ZL1WFD Details unknown
ZL1WG Boric, H. V., 27 Cleary Road, Panmure, Auckland 1006
ZL1WGA Addison, G., 99 Richmond Avenue, Tokoroa 2392
ZL1WGB Bold, G. T., 15 Kauri Road, Birkenhead, Auckland 1310
ZL1WGC Details unknown
ZL1WGL Lawson, Garry, 175 Tramway Road, Pukekohe 1800
ZL1WGP Details unknown
ZL1WGR Details unknown
ZL1WH Coe, P. H., 21 Marshall Avenue, Taupo 2730
ZL1WHA Ahmu, H. E., 386 Roscommon Road, Manurewa, Auckland 1702
ZL1WHL Leinwand, Helen, 73 Tender Road, Dairy Flat, RD 4, Albany, Auckland 1311
ZL1WHY Broberg, A. L., Unit 2 - 56 Evans Road, Glen Eden, Auckland 1007
ZL1WI Milam, R. E., 3 Bush Road, Oratia, Auckland 1007
ZL1WIL Collis, W. F., 143 Selwyn Street, Onehunga, Auckland 1006
ZL1WIM MacKenzie, I. L., 33a Norman Road, Takapuna, Auckland 1309
ZL1WIT Out, J. N., 64 Ellerton Road, Balmoral, Auckland 1003
ZL1WJL Livsey, W. J. A., 30 Hagman Street, Stafford Heights, Brisbane 4053, Queensland

ZL1WJM Mason, J., 23 Williams Avenue, Pakuranga 1706
ZL1WJP Details unknown
ZL1WJQ Quinn, J. A., PO Box 24-021, Royal Oak, Auckland 1030
ZL1WJR Details unknown
ZL1WJW West, W. J., Appleton Road, PO Box 383, Opotiki 3092
ZL1WK MacDonald, J. E., 171 Cook Street, Howick, Auckland 1705
ZL1WL Clarke, R. F. R., 14 Sherwood Road, Onerahi, Whangarei 0101
ZL1WM Ritchie, Graham, 38 Greenhaven Avenue, Papakura 1703
ZL1WMD Pope, A. A. (Ms), 85 Campbell Road, One Tree Hill, Auckland 1006
ZL1WN Biggar, R. G., Sunnyside Road, RD 3, Albany 1311
ZL1WNZ Blair, R. A., 22 Rebecca Rise, Weymouth, South Auckland 1702
ZL1WOT Details unknown
ZL1WP Johnstone, M. R., 12 Brookesmith Drive, Waiuku 1852
ZL1WPG Grewal, P. S., 39 La Rosa Street, Green Bay, Auckland 1007
ZL1WPJ Johnson, P. J., PO Box 60 202, Titirangi, Auckland 1230
ZL1WPK Petersen, Kiely, 10 Mews Place, Hamilton 2001
ZL1WPR Smith, P. R., Budden Road, RD 1, Te Awamutu 2400
ZL1WQ Whitehead, E. J., Booms Hill, Kauaeranga, RD 2, Thames 2821
ZL1WR Cullen, R. G., 6 Amokura Street, Waikanae 6010
ZL1WRB Bloomfield, D., 191 Kauri Road, Whenuapai, Auckland 1008
ZL1WRC Costello, R. L., 4 Taratoa Street, Panmure, Auckland 1006
ZL1WRD Deverell, R., 44 Mackesy Road, Whangarei 0101
ZL1WRO Boshier, R., 30 Ayton Drive, Glenfield, Auckland 1309
ZL1WRS Details unknown
ZL1WSK Kuypers, S. G., 25 Tamatea Avenue, Point England, Auckland 1006
ZL1WTC Details unknown
ZL1WTP Petricevich, A. M., PO Box 26-484, Epsom, Auckland 1030
ZL1WTT Taylor, G., PO Box 97-732, South Auckland Mail Centre, Auckland 1730
ZL1WTW Klinac, P. (Mrs), 45 Central Avenue, Papatoetoe, Auckland 1701
ZL1WU Moseley, M. R., PO Box 296, 34 Domain Street, Waiuku 1852
ZL1WV Fleetwood, F., 2/10 Tina Place, Pakuranga, Auckland 1706
ZL1WW Spackman, T. J., 4 Colquhoun Place, Dinsdale, Hamilton 2001
ZL1WWK Cramond, W. E. H., 103 Wharf Road, Te Atatu, Auckland 1008
ZL1WWM Details unknown
ZL1WWW Westerbaan, B. H., 38 Whittaker Street, Kihikihi 2430
ZL1WX Prebble, N. W., 2/82 Knights Road, Rothesay Bay, Auckland 1311
ZL1WYS Barlett, R. K. M., Address unknown
ZL1WZ Deslandes, E. N., 579 Spencer Road, Lake Tarawera, RD 5, Rotorua 3221
ZL1YOT King, M., 207a Woodlands Park Road, Titarangi, Auckland 1007
ZL1ZLD Surburban Amateur Radio Club (Inc.), See Branch Directory
ZL1ZLF Surburban Amateur Radio Club (Inc.), Museum group call-sign, See Branch Directory

ZL2 CALL-SIGNS

ZL2AA Gisborne Branch, see Branch Directory
ZL2AAA White, M. C., 502 Huia Street, Hastings 4201
ZL2AAC Bridgman, A. H. S., 261 Mitchell Street, Brooklyn, Wellington 6002
ZL2AAE Kelling, A. R., 3 Dickson Street, Gisborne 3801
ZL2AAG Barker, E. J., 12 Ashford Avenue, Palmerston North 5301
ZL2AAH Sayers, R. K. F., 33 Bamber Street, Castlecliff, Wanganui 5001
ZL2AAI McPake, E. G., 36 Wikitoria Road, Wanganui 5001
ZL2AAJ Davis, S. B., 8 Kawau Place, Wanganui 5001
ZL2AAK Tiro, T., 20 Bedford Street, Porirua 6006
ZL2AAN Thompson, R. N., 1010 Gordon Road, Hastings 4201
ZL2AAO Shackel, M. W. O., C/- Post Office, Opua 0290
ZL2AAQ Jeffers, R. J., 55a Jellicoe Street, Wanganui 5001
ZL2AAW Berdebes, P. G., 12 Beach Street, Tangimoana 5450
ZL2AAX Martin, L. H., 64 Glen Road, Stokes Valley, Wellington 6008
ZL2AB New Plymouth Amateur Radio Club, see Branch Directory
ZL2ABB Campbell, S. H., 20 Erin Street, Palmerston North 5301
ZL2ABE Erwood, E., 190 Waimea Road, Nelson 7001
ZL2ABF Foley, T. J., 115 Taradale Road, Napier 4001
ZL2ABJ Napier Branch NZART (Inc.), see Branch Directory
ZL2ABL Bramley, K. J., 14 Rembrandt Avenue, Linden 6006
ZL2ABM Elvy, D. L., 7 Norwich Street, Wellington 6005
ZL2ABN Ridding, G. B., 10 Trevor Terrace, Paremata, Porirua 6006
ZL2ABS Tong, J., 44 Lakewood Avenue, Johnsonville, Wellington 6004
ZL2ABT Turner, O. D., Cadman Road, Dannevirke 5491
ZL2ABU van der Burgh, J. E. C., 8c Egmont Street, Wellington 6001
ZL2ABW Steer, D. W., 24 Dorset Avenue, New Plymouth 4601
ZL2ABY Huggard, J. D., 22a Rimu Street, New Plymouth 4601
ZL2ABZ Moore, J. A. W., 112b Britomart Street, Berhampore, Wellington 6002
ZL2AC Turnbull, P., Omokoroa Road, RD 2, Tauranga 3021
ZL2ACA Barnett, W. J., RD 1, Upper Moutere 7152
ZL2ACC Sutherland, J. M., 600 Pepper Street, Hastings 4201
ZL2ACE Greene, R. P., 5 Aranui Avenue, Castlecliff, Wanganui 5001
ZL2ACF Stagpoole, V. M., 49 Bould Street, Johnsonville, Wellington 6004
ZL2ACK Details unknown
ZL2ACL Myhill, J., 63 Deepdale Street, Burnside, Christchurch 8005
ZL2ACN Lakeman, D. T., 55a Manuka Street, Masterton 5901
ZL2ACO Jeffs, D. E., 14 Freyberg Crescent, Waikanae Beach 6010
ZL2ACT Smith, G. F., 26 Sheridan Crescent, Upper Hutt 6007
ZL2ACU Finlay, P. A., 14 Garden Road, Northland, Wellington 6005
ZL2ACW Gotlieb, R., PO Box 27-137, Marion Square, Wellington 6030
ZL2AD Conroy, T. R., 8 Wairakei Road, Christchurch 8005
ZL2ADA Anderson, J. K., 26 Hawai Street, Taupo 2730
ZL2ADB Barrow, G. W. B., 60 Bledisloe Crescent, Wainuiomata 6008
ZL2ADD Lund, O. M., 1 Cherry Grove, Strathmore, Wellington 6003
ZL2ADG Donovan, G. J., PO Box 191, M.P.C. BB 3577, B.S.B, Brunei, S.E. Asia
ZL2ADK Purdie, Cathy, 65 Hedge Street, Sanson 5450
ZL2ADM Smith, I. G., Hill View, 94 Guppy Road, Greenmeadows, Napier 4001
ZL2ADN Stuart, J. D., 11 Kipling Street, Palmerston North 5301
ZL2ADO Wilkinson, J., 69a Park Road, Carterton 5951
ZL2ADP Vile, M. E., 17 Park Aveue, Waikanae 6010
ZL2ADR Burley, C. J., Ringawhati Road, RD 1, Otaki 5560
ZL2ADT Brown, W. C., 9a Rawhiti Street, Nelson 7001
ZL2ADU Gorton, H. J., 30 Dieffenbach Street, Opunake 4854
ZL2ADW West, J. D., 140 Pioneer Road, New Plymouth 4601
ZL2ADY Gallagher, B. G., 5 George Street, Dannevirke 5491
ZL2AE Lancaster, A. B., 47 Frank Wilson Terrace, New Plymouth 4601
ZL2AEL Locke, A. E., 19 Duncan Street, Tawa 6006
ZL2AEM Robinson, P. H., 10b Barriball Street, New Plymouth 4601
ZL2AF Wilkinson, J., 30 Lancaster Street, Levin 5500
ZL2AFC Burr, M. K., 48 Holborn Drive, Stokes Valley 6008
ZL2AFE Clarkson, R. J., 44 Bedford Street, Patea 5181
ZL2AFI Nicholls, G. A., 465 Ruahine Street, Palmerston North 5301
ZL2AFK Ford, P. L., 36 Akatea Road, Korokoro, Petone 6008
ZL2AFL Jordan, N., Casa Loma, Western Hutt Road, Melling, Lower Hutt 6009
ZL2AFM Hawke, P. D., 91a Tipahi Street, Nelson 7001
ZL2AFN MacLean, A. K., PO Box 59, Raetihi 5462
ZL2AFO Burney, R. J., 115 Kowhai Street, Naenae, Lower Hutt 6009
ZL2AFP Wassilieff, C., 69 Tiber Street, Island Bay, Wellington 6002
ZL2AFR Gorman, B. D., 66 Pacific Street, Timaru 8601
ZL2AFT Anderson, B. P., 429 Albert Street, Palmerston North 5301
ZL2AFU Udy, H. A. F., 1 Tudor Road, Pahiatua 5470
ZL2AFV Titahi Bay Branch NZART (Inc.), see Branch Directory
ZL2AFW Jones, B. N., 13 Taupata Street, Castlecliff, Wanganui 5001
ZL2AFY Smith, I. M., 26c Victoria Road, Mt Maunganui, Tauranga 3002
ZL2AFZ Studd, G. C., 14/18 Carnell Street, Napier 4001
ZL2AGC Waldmann, K. J., PO Box 47-047, Upper Hutt 6430
ZL2AGH Marshall, A. W., 32 Plymouth Road, Hastings 4201
ZL2AGI Giles, F. A., 1006 Sussex Street, Hastings 4201
ZL2AGM Weaver, D. B., 6 Tankersley Crescent, Masterton 5901
ZL2AGO Wolf, J. M., 12 Celeste Place, Glenfield, Auckland 1310
ZL2AGQ Cleveland, F. L., 38 Havelock Street, Mornington, Wellington 6002
ZL2AGS Gotlieb, G. D. (Mrs), PO Box 27-137, Marion Square, Wellington 6037
ZL2AGT Williams, G. C., 18 Ronberg Street, Palmerston North 5301
ZL2AGU Steel, G. J., Address unknown
ZL2AGW Gillon, K. R., 5 Mountview Place, Motueka 7161
ZL2AGY Marr, A. H., PO Box 3, Greytown 5953
ZL2AH Reed, W. St. J., 11 Wood Street, Upper Hutt 6007
ZL2AHA Wards, I. J., Manutahi, RD 2, Patea 5181
ZL2AHB Douglas, L. S., 9 Swithland Place, Christchurch 8004
ZL2AHE Wilson, A. J., 30 Adventure Drive, Whitby, Porirua 6006
ZL2AHH Keong, P. W., PO Box 8108, Havelock North 4230
ZL2AHI Meads, A. M., 23 Darwin Crescent, New Plymouth 4601
ZL2AHM Smith, R. A., 121 Slacks Road, Palmerston North 5301
ZL2AHN Ashley, R. A., Te Horo Beach Road, RD 1, Otaki 5560
ZL2AHO Owen, D. W., 12 Whirinaki Crescent, Heretaunga, Upper Hutt 6007
ZL2AHR Hawtree, G. R., 50 Fox Road, Wanganui 5001
ZL2AHU O'Hara, E. R., 8 Miller Place, Masterton 5901
ZL2AHX Greaney, E. C., 168 Waghorne Street, Napier 4001
ZL2AHY Howard, C. B., 24b Clearmont Crescent, New Plymouth 4601
ZL2AI 1st Kelburn 1909 Scout Group Radio Club, (Trustee T.R. Millar), 39 Ngaio Road, Kelburn, Wellington 6005
ZL2AIA Steele, R., PO Box 13-467, Onehunga, Auckland 1132
ZL2AIB Campbell, W. A., 225a Tukapa Street, New Plymouth 4601
ZL2AIC Drogemuller, C. H., 25d Egmont Street, Wanganui 5001
ZL2AID Williams, P. R., 126 Fairfield Road, Hawera 4800
ZL2AIE Parker, W. J., PO Box 1, Blenheim 7315
ZL2AIJ Newbery, M. D., 35 Crofton Road, Ngaio, Wellington 6004
ZL2AIK Smyth, W. M., 49c Doralto Road, New Plymouth 4601
ZL2AIL McManaway, P. H., RD 1, Matarawa, Carterton 5951
ZL2AIN James, L. A., 110 Redwood Street, Blenheim 7301
ZL2AIO Voss, R. B., Mill Road, Kopane, RD 6, Palmerston North 5321
ZL2AIP Curry, R. G., 1 Flaxmere Street, Waikanae 6010
ZL2AIR Morris, S. W., Main Highway, Clarteville, Carterton 5951
ZL2AIS Cramer, F. H., 34 James Street, Inglewood 4651
ZL2AIT Whiting, P. C., c/- 38 Sanders Avenue, New Plymouth 4601
ZL2AIX Gemmell, A. F., 56 Harris Street, Gisborne 3801
ZL2AIY Hunter, D. R., 16 Torlesse Street, Wakatu, Nelson 7001
ZL2AIZ Wright, L. L., 30 Discovery Drive, Whitby 6006
ZL2AJ Parminter, H. V., 51a Rotherham Terrace, Miramar, Wellington 6003
ZL2AJA Plum, B. F., 6 Porritt Place, Stoke, Nelson 7001
ZL2AJB Hodge, L. D., 23 Kent Crescent, Palmerston North 5301
ZL2AJC Hulse, R. L., 63 Riverside Drive, Lower Hutt 6009
ZL2AJD Dodds, J. F., c/- PO Box 237, Waikanae 6454
ZL2AJE Carpenter, E. D., Address unknown
ZL2AJF Vernon, J. H., 130 Mairangi Road, Wilton, Wellington 6005
ZL2AJG Giblin, A. G., 27 West Avenue, Richmond, Nelson 7002
ZL2AJH Andrews, L. M., PO Box 10-575, The Terrace, Wellington 6036
ZL2AJJ McHardy, R. A., 762 Gladstone Road, Gisborne 3801
ZL2AJL Sutherland, D. C., 23 Peakes Road, Wanganui 5001
ZL2AJQ Compier, J. C., 611 Aberdeen Road, Gisborne 3801
ZL2AJR Teward, G. J., 26 Horopito Road, Waikanae 6010
ZL2AJS Lawn, B. A., 60b Govett Avenue, New Plymouth 4601
ZL2AJV Small, I. R., 60 Whakaipo Avenue, Taupo 2730
ZL2AJZ Wellington Polytechnic Radio Club, Private Box 756, Wellington 6015
ZL2AK Rowson, L. T., 21 Kellyville Heights, New Plymouth 4601
ZL2AKC Larkin, J. F. L., 24 Surrey Road, Wanganui 5001
ZL2AKD Faulding, R. G., 5 Manuka Street, Palmerston North 5301
ZL2AKE Watson, M. B., 25 Armagh Terrace, Marton 5460
ZL2AKF Peffers, W. F., Spade Oak Vineyard, Main Road, Makauri RD 1, Gisborne 3821
ZL2AKG McGonigal, J. W. R., 17 Surrey Street, Taradale, Napier 4001
ZL2AKJ Freeth, C. A., 56 Fifeshire Crescent, Nelson 7001
ZL2AKK Moss, J. B., 9 Seyton Street, Stratford 4700
ZL2AKM Glassey, R. B., 52 Bourne Crescent, Papanui, Christchurch 8005
ZL2AKN Smith, L. K., PO Box 1119, Tauranga 3015
ZL2AKO Oakley, J. W., Slipstream, PO Box 279, Waikanae 6454
ZL2AKR Roberts, E., 116 Kowhai Street, Naenae, Lower Hutt 6009
ZL2AKS Taylor, D., 31 Ahuriri Street, Wellington 6003
ZL2AKT Bundle, R. J., 12 Mahoe Street, Linden, Wellington 6006
ZL2AKU Crosby, B. D., 28 Sheridan Crescent, Upper Hutt 6007
ZL2AKV Copeland, R. N., 11 Te Puni Grove, Upper Hutt 6007
ZL2AKW King, T. C., 72 Chelmsford Street, Wellington 6004
ZL2AKZ Barden, T. W. A., Paradise Road, Coopers Beach, PO Box 5, Mangonui 0557
ZL2AL Jennings, L. F., 203 Beresford Street, Hastings 4201
ZL2ALA Kenny, A. R., 60 Pokohiwi Road, Normandale, Lower Hutt 6009
ZL2ALC Maxwell, H. J., 122 Kawiu Road, Levin 5500
ZL2ALD Gillespie, M. E., PO Box 667, Papakura, Auckland 1730

ZL2ALI Clark, E. A., 88 Mallberry Road, Mangere East, Auckland 1701
ZL2ALJ Fletcher, A. B., 127 Melbourne Road, Island Bay, Wellington 6002
ZL2ALL Tompkins, A. W., Halcombe Road, RD 5, Feilding 5600
ZL2ALM Lovegrove, P. J., 145 Carlisle Road, Browns Bay, Auckland 1311
ZL2ALO Shearman, A. J., 12 Somerset Road, Springvale, Wanganui 5001
ZL2ALP Paton, P. J., 41 Hyde Street, Wainuiomata 6008
ZL2ALQ Appleton, J. W., 17 Bone Crescent, Hawera 4800
ZL2ALR Jury, J. M., "Glendower", Ponatahi Road, RD 2, Carterton 5951
ZL2ALT Tong, A. C., 12 Princes Street, Hawera 4800
ZL2ALX Tarrant, G. W., Rawhitirua, RD 8, Masterton 5921
ZL2ALY Walker, C. M., 244a Te Moana Road, Waikanae 6010
ZL2ALZ Healey, G. W. R., 78 Sidlaw Street, Strathmore Park, Wellington 6003
ZL2AM Details unknown
ZL2AMA Dwyer, M. B., PO Box 7313, Wellington South 6039
ZL2AMB Chinery, P. R. J., 192 High Street, Eltham 4657
ZL2AMC Sargent, F. W., Schollum Road, RD 2, Morrinsville 2251
ZL2AMD Lamont, D. H., 510 Kennedy Road, Napier 4001
ZL2AME Heath, C. A., 9 Patutu Grove, Upper Hutt 6007
ZL2AMI Stewart, R. G., 105 Orangi Kaupapa Road, Wellington 6005
ZL2AMJ Johnson, J. F. C., 15 Field Street, Upper Hutt 6007
ZL2AMK Vendt, G. R., 60 Bird Grove, Stokes Valley 6008
ZL2AMM Morris, S. J., 1 Sidlaw Street, Strathmore, Wellington 6003
ZL2AMO Spackman, M. L., 2/168 Gloucester Street, Taradale, Napier 4001
ZL2AMP Fretter, M. E., 111b Maxwell Road, Blenheim 7301
ZL2AMR Feilding and Districts Radio Club, see Branch Directory
ZL2AMS Marton Branch NZART (Inc.), see Branch Directory
ZL2AMT Garmonsway, T. L., "Hiria", Rangiwaea, RD 1, Taihape 5457
ZL2AMU Ashe, D. A., 34 Wai-iti Crescent, Lower Hutt 6009
ZL2AMV Mudford, D. W., 58 Le Quesne Road, Bay View, Napier 4151
ZL2AMY Davies, D. D., 83 Glen Road, Raumati South 6010
ZL2AMZ Humphris, G. J., 24 Wood Leigh Mews, Paraparaumu Beach 6010
ZL2AN Shepherd, E. R., 375 Brookfields Road, RD 3, Napier 4021
ZL2ANB Fenton, F. A., 27 Blake Street, Waitara 4656
ZL2ANG Tipler, B. F., Kahouri Road, PO Box 400, Stratford 4700
ZL2ANI McLeod, S. A., 4 Trevelyan Street, Onekawa, Napier 4001
ZL2ANJ McNabb, G. M. (Mrs), 300 High Street, Motueka 7161
ZL2ANN Opunake Radio Club Inc, see Branch Directory
ZL2ANP Williamson, J. J., Waituna, 9 RD, Feilding 5600
ZL2ANQ Keane, P. M. (Rev), PO Box 1151, Campion Road, Gisborne 3815
ZL2ANS Martin, D. W., 111 Avenue Road, Greenmeadows, Napier 4001
ZL2AO Details unknown
ZL2AOA Wall, T. F., Mahaki, RD 1, Martinborough 5954
ZL2AOE Details unknown
ZL2AOF Reardon, V. W., Autler Road, Manaia 4851
ZL2AOG Green, G. R., 7 Russell Street, Marton 5460
ZL2AOH Sutton, Ralph, 12c Herbert Gardens, 186 The Terrace, Wellington 6001
ZL2AOI Malkin, E., 4/412 Avenue Road West, Hastings 4201
ZL2AOJ Ryder, S. F., 67 Gillespies Road, Upper Hutt 6007
ZL2AOK Wallis, G. A., 42 Coronation Street, Spreydon, Christchurch 8002
ZL2AOL McBeth, D. O., 12 Herekawe Drive, New Plymouth 4601
ZL2AOO Sinclair, M. L., 1 Porritt Place, Tamatea, Napier 4001
ZL2AOP Mackintosh, A. B., 34 Marian Drive, Gisborne 3801
ZL2AOT Sanders, K. D., 15 Newbourne Crescent, Blenheim 7301
ZL2AOU Howan, V. E. (Mrs), 7 Almora View, Ascot Park, Porirua 6006
ZL2AOV McNeill, D. A., 58 Fraser Avenue, Johnsonville, Wellington 6004
ZL2AOW Purvis, R. H., 37 Sispara Place, Beachhaven, Auckland 1310
ZL2AOZ Davidson, W. E., RD 10, Palmerston North 5321
ZL2AP De Greeuw, J. F. M., 12 Grange Road, Haumoana 4250
ZL2APA Chippendale, J. G., 66 Reid Avenue, Hawera 4800
ZL2APC Burton, H., 23 Lynmouth Avenue, Karori, Wellington 6005
ZL2APD Holmwood, E. A., 11 Newton Place, Palmerston North 5301
ZL2APE Parnell, J. C., 87 Duncan Terrace, Kilbirnie, Wellington 6003
ZL2APF Lusty, F. W., 40 Ihaia Street, Waitara 4656
ZL2APH Haisman, R. A., 27 Valley Road, Gisborne 3801
ZL2APJ Details unknown
ZL2APL Westwood, I. J., 95 Hillcrest Drive, Palmerston North 5301
ZL2APO Leigh, P., 4 Parcell Court, Cromwell 9191
ZL2APT Ropata, P. T., Address unknown
ZL2APV Jury, G. V., 12 Aubrey Street, New Plymouth 4601
ZL2APX O'Dwyer, M., 135 Guppy Road, Taradale, Napier 4001
ZL2APY Hartwig, G., 23 Grey Street, Woodville 5473
ZL2APZ Benson, K. J., 33 Trafalgar Street, New Plymouth 4601
ZL2AQ Gabites, J. F., 40c Ocean Road, Paraparaumu Beach 6010
ZL2AQD Watson, J. E., 28 Harry Shaw Way, Raumati 6010
ZL2AQH Voss, S. J., Mill Road, Kopane, RD 6, Palmerston North 5321
ZL2AQI Cheyne, J. A., 12 Aberdeen Avenue, Palmerston North 5301
ZL2AQK Millard, A. J., 34 Volga Street, Wellington 6002
ZL2AQL Spearman, M. B., 41 Woods Avenue, Tauranga 3001
ZL2AQN Heald, P. J., 64 Wyon Street, Christchurch 8006
ZL2AQO Wilson, K. A. (Mrs), 80 Wycliffe Street, Onekawa, Napier 4001
ZL2AQP Clouston, T. W., 28 Fox Street, Opunake 4854
ZL2AQR Crawley, R. J. C., RD 9, Mayfield, Ashburton 8352
ZL2AQS Duckworth, P. D., 7 Einstein Street, Gisborne 3801
ZL2AQT Benton, S. W., "Wainawhenua", Kahautara Road, RD 1, Featherston 5952
ZL2AQV Smith, R. E., 8 Dell Road, Raumati South, Paraparaumu 6010
ZL2AQX Macartney, R. A., 129 Seaview Road, New Plymouth 4601
ZL2AQY Olson, E. L., 58 Titania Street, Stratford 4700
ZL2AR Central Hawkes Bay Branch NZART (Inc), see Branch Directory
ZL2ARD Schofield, D. T., 34 Kiwi Road, Raumati Beach 6010
ZL2ARE Harris, L. W., 43a Cameron Road, Napier 4001
ZL2ARF Lane, J. R., 3 Bassett Place, Taradale, Napier 4001
ZL2ARG Nelson Branch NZART (Inc), see Branch Directory
ZL2ARI Wills, A. J., 45 Ruahine Street, Paraparaumu 6010
ZL2ARJ Webb, B. D., 71 Hillside Drive, Upper Hutt 6007
ZL2ARN Stewart, D. G., 75 Nimmo Avenue East, Waikanae 6010
ZL2ARP Collins, R. J., "L'Chayim", Peka Peka Road, RD 1, Waikanae 6010
ZL2ARQ Pahl, D. G., PO Box 61, Motueka 7161
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ZL2ARV Black, R. C., 25 Marsden Road, Stoke, Nelson 7001
ZL2ARW Williams, P. R., 15 Pinny Avenue, Lower Hutt 6009
ZL2ARY Jenks, M. D., 25 Kirner Street, Christchurch 8009
ZL2ARZ Collins, J. L., 5 Norrie Place, Tamatea, Napier 4001
ZL2AS Hastings Branch NZART (Inc.), see Branch Directory
ZL2ASA Dinsdale, B., 14 Benmore Avenue, Palmerston North 5301
ZL2ASC Denton, R. J., 17 Rangiora Terrace, Tahunanui, Nelson 7001
ZL2ASD Darby, A. R., 47 MacLaren Street, Maymorn, RD 1, Upper Hutt 6007
ZL2ASE Williams, R. B., 35 Trelawney Road, Wainuiomata 6008
ZL2ASF Fogerty, S. F., 5 McCarthy Crescent, Motueka 7161
ZL2ASH Clark, B. S., 5 Mamaku Grove, Khandallah, Wellington 6004
ZL2ASK Rawding, D., 12 Herbert Avenue, Raumati South 6010
ZL2ASO Sewell, J. R., 1 Riverside Grove, Hine Road, Wainuiomata 6008
ZL2ASQ Dawson, E. K., 680 East Coast Road, Browns Bay, Auckland 1311
ZL2ASR Gill, A. H., 84 McHardy Street, Havelock North 4201
ZL2AST Groombridge, J. E., 15 Oakleigh Street, Maungaraki, Lower Hutt 6009
ZL2ASW Avery, G. S., 24 Tudor Grove, Feilding 5600
ZL2ASY Currie, R. G., 75 Hair Street, Wainuiomata 6008
ZL2ASZ Wardlaw, D. A., NZART, PO Box 40-525, Astral Towers, Upper Hutt 6415
ZL2AT Fabian, R. R., c/- PO Box 265, Picton 7372
ZL2ATB Blackwell, F. N., 103 Kenmore Street, Newlands, Wellington 6004
ZL2ATC Harris, E. J. (Mrs), 43c Cameron Road, Napier 4001
ZL2ATE Manley, R. C., 22 Amberley Avenue, Palmerston North 5301
ZL2ATI Cartwright, K. C., 8 McNaughton Street, Waitara 4656
ZL2ATL Lategan, P. A., 88 Ayton Drive, Whitby, Wellington 6006
ZL2ATM Details unknown
ZL2ATO Oborn, L. E., 91 Norton Park Grove, Lower Hutt 6009
ZL2ATP Hursthouse, M. W. (Dr), 306 Princes Drive, Nelson 7001
ZL2ATT Thompson, A. J., 11 London Terrace, Palmerston North 5301
ZL2ATU Horn, I. G., 79 Thatcher Street, Castlecliff, Wanganui 5001
ZL2ATV Clench, H. J., 22 Spinnaker Drive, Flagstaff, Hamilton 2001
ZL2ATX Haskell, E. H. E., 1 Moana Terrace, Snells Beach, Warkworth 1241
ZL2AU Wilson, W. C., 21 London Road, Korokoro, Lower Hutt 6008
ZL2AUA Burch, M. A. G., 49 Kahu Road, Paremata, Porirua 6006
ZL2AUB Moore, P. J., 54 Herbert Avenue, Palmerston North 5301
ZL2AUD Martin, W., 4 Bella Grove, Naenae, Lower Hutt 6009
ZL2AUE King, M., 110 Gordon Street, Masterton 5901
ZL2AUF Blair, S. G., 15 Poplar Grove, Thorndon, Wellington 6001
ZL2AUH O'Shea, P. F., 106a Frimley Avenue, Hastings 4201
ZL2AUI Danrell, F. R., 1215 North Willowpark Road, Hastings 4201
ZL2AUJ Catchpole, D., 25 Tai Paku Paku Road, Miramar, Wellington 6003
ZL2AUK Leckie, D. A., 31 City View Grove, Harbour View, Lower Hutt 6009
ZL2AUR Tong, Tse-Ying, 390a Ferguson Drive, Trentham, Upper Hutt 6007
ZL2AUT Morton, L. W., 112 Union Street, Foxton 5551
ZL2AUW Nash, A. L. J., 20 Seddon Street, Levin 5500
ZL2AUX Lewer, D. H., 113 Pukepapa Road, Marton 5460
ZL2AUZ Blair, R. L., 12 Cleland Street, Palmerston North 5301
ZL2AV Jenkins, I. J., 35 Oak Avenue, Paremata 6006
ZL2AVA McLauchlan, A. A. W., 81 Parker Avenue, Levin 5500
ZL2AVB Hargreaves, A. P., 22c High Street, Eltham 4657

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ZL2AVC McDermott, R. J. O., 35 Highbury Road, Kelburn, Wellington 6005
ZL2AVF Gibbs, L. V., 19 Camellia Terrace, Lower Hutt 6008
ZL2AVG Reynolds, M. G., 131 Mt Herbert Road, Waipukurau 4176
ZL2AVH Chong, A. V., Address unknown
ZL2AVI Savage, R. B., 12 Hull Street, Oamaru 8901
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ZL2AVK Kane, D., 11 Bay Street, Petone 6008
ZL2AVL Luscombe, G. W., Main Road, Waiouru 5458
ZL2AVM Morris, R. H. C., 21 Rangoon Street, Khandallah, Wellington 6004
ZL2AVR Dinnie, J. S., 27 Rodney Avenue, Te Horo Beach. Postal: PO Box 8, Te Horo 5560
ZL2AVS Heath, B. O., 389 Muritai Road, Eastbourne 6008
ZL2AVX Rhodes, C. J., 23 Govind Grove, Ngaio, Wellington 6004
ZL2AVY Owen, M. L., 550 Kane Street, Pirongia 2450
ZL2AW Bonnington, R. L., 744 Cable Bay Road, RD 1, Nelson 7021
ZL2AWA Farquhar, W. E., 17 Stansell Avenue, Nelson 7001
ZL2AWE Cooke, P., 31 Kent Crescent, Palmerston North 5301
ZL2AWF Alexander, D. G., 34 Tennyson Street, Petone 6008
ZL2AWG Roberts, J. C., 40 Grahams Road, Christchurch 8004
ZL2AWH Brosnan, D. C., 111 Flaxmere Avenue, Hastings 4201
ZL2AWI Sherley, H. F., 37 Kiwi Road, Raumati Beach 6010
ZL2AWJ Woodhouse, C. W., 51 Hautana Street, Lower Hutt 6009
ZL2AWN Lewis, L. D., 20 Horopito Road, Waikanae 6010
ZL2AWR Roberts, A. W., 184 Ikitara Road, Wanganui East 5001
ZL2AWS Sayers, P. A., 97 Happy Valley Road, Ohiro Bay, Wellington 6002
ZL2AWU Tiller, B. A., 37 Cedar Drive, Paraparaumu Beach 6010
ZL2AWY Williams, D. M., 5 Boons Valley Road, Waikawa, Picton 7372
ZL2AX Ward, J. G., Church Road, Makotuku, RD 7, Dannevirke 5491
ZL2AXA Dewar, A. M., 248a Ohiro Road, Wellington 6002
ZL2AXB Crawley, D. R. K., Campbell Road, RD 1, Wanganui 5021
ZL2AXG Young, W. D. D., 20 Rexwood Street, Carterton 5951
ZL2AXH Aitchison, W. B., 10 Margaret Street, Wadestown, Wellington 6001
ZL2AXI Leslie, G., 4 Reeve Street, Foxton 5551
ZL2AXK Sommerville, W. V., 21 Bridge View Road, Birkenhead, Auckland 1310
ZL2AXL Harvey, P. R., 4a Norton Road, Otumoetai, Tauranga 3021
ZL2AXN Crane, R. G., 11 Dickens Lane, RD 1, Wanganui 5021
ZL2AXO Mathers, R. W., PO Box 54, Pohara Valley Road, Takaka 7172
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ZL2AXQ Rowlands, R. E., Address unknown
ZL2AXR Ramsay, K. A., 130a Cheviot Road, Lowry Bay, Wellington 6008
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ZL2AXU Wharton, J. H., 1 Raniera Street, New Plymouth 4601
ZL2AXV Hulston, J. R., 7 Earlston Grove, Lower Hutt 6009
ZL2AXW Andrew, P. J., 6 Eton Place, Palmerston North 5301
ZL2AXY Devenport, J. A., 17 Sunny Grove, Wainuiomata 6008
ZL2AXZ Goodfellow, D. R., 4 Glenties Lane, Ellerslie, Auckland 1005
ZL2AY McComb, D. R., 20 Montrose Drive, Atawhai, Nelson 7001
ZL2AYB Fisher, W. G., 40 Beauchamp Street, Karori, Wellington 6005
ZL2AYD Barker, B. A., 62 Gregg Street, Dannevirke 5491
ZL2AYE Wastney, R. J., 126 The Ridgeway, Stoke, Nelson 7001
ZL2AYF Amies, B. W., 15 Lyndhurst Road, Tawa 6006
ZL2AYG Bowden, R. E., 10 Kennedy Grove, Stokes Valley, Lower Hutt 6008
ZL2AYK Kelly, R. W., Address unknown
ZL2AYM Scholefield, C. O., Telenius Road, Spring Grove, RD 1, Wakefield 7181
ZL2AYQ Hill, K. J., 27 Welland Place, Island Bay, Wellington 6002
ZL2AYS Burton, F. S., 48 Wikitoria Road, Wanganui 5001
ZL2AYT Bolton, P. E., 27 Ariki Street, Lower Hutt 6009
ZL2AYU Leask, D. W., 11 Cannon Street, New Plymouth 4601
ZL2AYX Pohl, K. P., 58 Norton Park Avenue, Lower Hutt 6009
ZL2AYY Waghorn, T. J., 75 Glen Road, Kelburn, Wellington 6005
ZL2AYZ Cousins, W. G., 1 Clinton Way, Wellington 6002
ZL2AZ Lake, P. B., 12 Brasenose Place, Tawa, Wellington 6006
ZL2AZA Borrell, D., 109 Pope Street, Camborne, Plimmerton 6006
ZL2AZC Dunn, D. A., 1017a Frederick Street, Hastings 4201
ZL2AZE Stretch, F., 25a Moana View Road, Waikawa, Picton 7372
ZL2AZG Dagg, R. I., 1009 Garry Street, Hastings 4201
ZL2AZH Noel, L. E. H., Humber Street, PO Box 133, Rongotea 5454
ZL2AZI Boivin, R. A., 505 Hastings Street South, Hastings 4201
ZL2AZJ Cole, A. G., 66 Ponsonby Road, Karori, Wellington 6005
ZL2AZK Lankshear, B. R., Moetapu Bay Road, RD 2, Picton 7372
ZL2AZN Walker, D. G., 16 Stephen Street, Johnsonville, Wellington 6004
ZL2AZP Pinny, H. G., 8 Wakefield Grove, Waikanae 6010
ZL2AZR Harris, M. G., 222 Main South Road, Paraparaumu 6010
ZL2AZV Stephen, J. M., 11 Reeve Drive, Havelock North 4201
ZL2AZY Owen, Biny, 550 Kane Street, Pirongia 2450
ZL2AZZ Randall, J. H., 7a Sunny Glen, Waikanae 6010
ZL2BA Grantham, T. C., 22 Boltons Road, Masterton 5901
ZL2BAC Osborne, T. G., Weedons Ross Road, RD 6, Christchurch 8021
ZL2BAE Searing, J. J., PO Box 6700, Marion Square, Wellington 6030
ZL2BAF Donoghue, C. J., 33 Gracechurch Drive, East Tamaki, Poatal: RD, Papatoetoe 1730
ZL2BAI Garth, Dorothy, 101 Birrell Street, Gisborne 3801
ZL2BAK Douglas, R. J., 507 Riverside Drive, Naenae, Lower Hutt 6009
ZL2BAQ Carr, P. H., 17 Timaru Grove, Kelson, Lower Hutt 6009
ZL2BAR Allardice, M. H., 49 Rajkot Terrace, Broadmeadows, Wellington 6004
ZL2BAS Longly, S. McL., 6a Lambton Road, Napier 4001
ZL2BAT Ramage, B. H., 95 Gossamer Drive, Pakuranga 1706
ZL2BAU Mallett, P. J., 22 Meehan Street, Blenheim 7301
ZL2BAV Ruddle, D. J., 12 Hannah Place, Redwood, Christchurch 8005
ZL2BAW McCarron, J. R., 73 Cedar Drive, Paraparaumu Beach 6010
ZL2BAY Elvy, S. J., "Larksfield", 034 St Leonards Road, RD 1, Blenheim 7321
ZL2BAZ Forrester, I. J., 3 Duncraig Street, Silverstream, Upper Hutt 6007
ZL2BB Bradshaw, F. R., 40 Simla Avenue, Havelock North 4201
ZL2BBA Rundle, W. J., PO Box 322, Torquay, Queensland 4655, Auslralia
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ZL2BBH Jansen, J. H., "Wairoaiti", Seafield Road, RD 1, Napier 4021
ZL2BBJ Corney, A. C., 43 Clutha Avenue, Khandallah, Wellington 6004
ZL2BBL Barwick, L. G. A., 25 Wades Avenue, Christchurch 8002
ZL2BBN Finch, B. P., 142 Brooklands Road, New Plymouth 4601
ZL2BBO Lealand, T. P., 16a Hunter Street, Hawera 4800
ZL2BBS Doig, A. M., 72 Gordon Road, Plimmerton 6006
ZL2BBT Grove, K. E., 3 Lomond Street, Newlands, Wellington 6004
ZL2BBU Pearmain, C. E., 47 Alton Street, Nelson 7001
ZL2BBZ Dickson, L. P., 57 Victoria Road, New Plymouth 4601
ZL2BC Gentry, K. R., 8 Chudleigh Grove, Churton Park, Wellington 6004
ZL2BCA Scott, D. L., 74 Dodson Valley Road, Atawhai, Nelson 7001
ZL2BCB Tunnicliffe, C. G., 15 Carmen Terrace, Snells Beach, Auckland 1241
ZL2BCD Dean, F. R. J., 47 Tweed Road, Papakowhai 6006
ZL2BCF Pratt, D. H., 30 Deepdale Street, Burnside, Christchurch 8005
ZL2BCG Jackson, J., 246 Thorp Street, Motueka 7161
ZL2BCH Brayshaw, K. V., 23 Tasman Street, Levin 5500
ZL2BCK Thorp, G. R., 28 Hetley Crescent, Taradale, Napier 4001
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ZL2BCM Details unknown
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ZL2BCR Christie, A. J., 32 Bateman Avenue, Bryndwr, Christchurch 8005
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ZL2BCT Clements, D. J., 179 Main Street, Greytown 5953
ZL2BCV Williams, C. W., 36 Tawa Road, Hawera 4800
ZL2BCW Kerr, M. J. B., 40 Rodrigo Road, Kilbirnie, Wellington 6003
ZL2BCY Wallen, E. J., 26 Fergusson Drive, Gisborne 3801
ZL2BCZ Bailey, I. K., c/- 10 Pembroke Street, Palmerston North 5301
ZL2BD Details unknown
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ZL2BDK Rodda, D. G., 4d Totara Street, Masterton 5901
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ZL2BDS Corbett, A. A. (Dr), 7 Morrington Terrace, Blenheim 7301
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ZL2BEG Cropp, B. A., 7 Blue Mountains Road, Silverstream 6007
ZL2BEJ Squire, D. N., 266 Old Coach Road, RD 9, Te Puke 3071
ZL2BEK Campbell, L. T., 14 Leighton Avenue, Lower Hutt 6009
ZL2BEL Hoogeveen, W., 74 Kauae Street, Manaia 4851
ZL2BEN Fretter, M. S. E., 46 Rawhiti Road, Pukerua Bay, Wellington 6010
ZL2BEP Whiteford, P. C., 46 Central Terrace, Kelburn, Wellington 6005

ZL2BEQ Penberthy, P. M., RD 5, Rangitiki Line, Newbury, Palmerston North 5321
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ZL2BET Johnston, E., 17a Wimbledon Grove, Wainuiomata 6008
ZL2BEU Neumer, E. M., 7 Copeland Street, Lower Hutt 6009
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ZL2BFC Cattermole, B. L., 20 Miltonia Avenue, Te Atatu South, Auckland 1008
ZL2BFE Fake, J. L., 44 Cumberland Street, New Plymouth 4601
ZL2BFF Cummerfield, G. C., 3 Croxley Place, Palmerston North 5301
ZL2BFG Webley, H. R., 32e Mission Street, Lower Hutt 6009
ZL2BFH Holt, D., 5 Hillary Heights, Gisborne 3801
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ZL2BFO Largerstedt, B. A., 26 Russell Road, Wainuiomata 6008
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ZL2BFR Wiggins, H. N., 23 Slacks Road, Palmerston North 5301
ZL2BFS Rushton, G. A. W., 149 Te Moana Road, Waikanae 6010
ZL2BFU Lacey, G., 27 Bledisloe Street, Masterton 5901
ZL2BFV McIver, W. C., 22a Ballance Street, New Plymouth 4601
ZL2BFW Peters, R. E. F., 35 Giblin Street, Richmond, Nelson 7002
ZL2BFX Kerr, A. J., c/- 40 Rodrigo Road, Kilbirnie, Wellington 6003
ZL2BFY Lambert, R., 7 Konini Street, Masterton 5901
ZL2BFZ Thum, F. A., 42 Rimu Street, Waikanae 6010
ZL2BG Williams, P. G., Mangakuri, RD 14, Havelock North 4230
ZL2BGC Passuello, M. G. D., 50 Apuka Street, Brooklyn, Wellington 6002
ZL2BGD York, R. W. F., 41a Nelson Street, Blenheim 7301
ZL2BGE Boyle, L., 37 Lewis Avenue, Wanganui 5001
ZL2BGF Toms, R. V., 45 Moncur Drive, Rotorua 3201
ZL2BGG Jamieson, J. C., 31 David Street, New Plymouth 4601
ZL2BGI Pycroft, W. J., 12 Ellesmere Avenue, Miramar, Wellington 6003
ZL2BGJ Jonas, G. M., Otaraoa Road, RD 43, Waitara 4656
ZL2BGL Conway, I. W., Caseys Road, RD, Seddon 7353
ZL2BGN Eccles, K. R., Tarrant Road, RD 1, Upper Moutere 7152
ZL2BGP Griffith, K. C., 20 Herewini Street, Titahi Bay, Wellington 6006
ZL2BGQ Buckton, G. S., 44 McLauchlan Street, Blenheim 7301
ZL2BGT Bennett, P., 190 Stafford Drive, Ruby Bay, Mapua 7155
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ZL2BH McGregor, I. J., 43 Kitchener Street, Masterton 5901
ZL2BHD Bateman, G. W., 54 Murray Avenue, Hawera 4800
ZL2BHE Walker, D. C., 46 Barnard Street, Wadestown, Wellington 6001
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ZL2BHH Burnham, E. D., 15 Tawa Street, Levin 5500
ZL2BHI Orams, K. J., 13 Eagle Street, Karori, Wellington 6005
ZL2BHJ Andrews, Jill, 66 Khandallah Road, Khandallah, Wellington 6004
ZL2BHK Johnson, D. H., 11 Linwood Drive, Paraparaumu 6010
ZL2BHL Fowler, R. L., Main Road, RD 3, Riwaka 7160
ZL2BHM Matthews, E. F., Moeawatea, RD 1, Waverley 5182
ZL2BHN Allardyce, J. P. G. (Rev), Marist Centre, 88 Hobson Street, Wellington 6001
ZL2BHO Henderson, R. L., 426 Gloucester Street, Taradale, Napier 4001
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ZL2BHR Inwood, R. G., 22 Benmore Avenue, Palmerston North 5301
ZL2BHS Bowden, C. J., 76 South Road, Masterton 5901
ZL2BHT McLaren, D. M., 26 Van Diemen Street, Nelson 7001
ZL2BHW Quayle, R. P., 2517 Waldrvia Way, Bwlingame, CA 94010, USA
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ZL2BI Hogan, T. J., PO Box 39-166, Wellington Mail Centre 6332
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ZL2BIG Bingham, W. J., 31 Elizabeth Street, Feilding 5600
ZL2BIJ Pugh, A. G. E., 1/50 Taharoto Road, Takapuna, Auckland 1309
ZL2BIL Cox, W. R., 5a Konini Grove, Raumati Beach 6010
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ZL2BIQ Thorner, G. S., 28 David Street, Invercargill 9501
ZL2BIR Kidd, P. R., 70 McLeod Street, Upper Hutt 6007
ZL2BIS Porter, I. G., 20 Belfield Street, Christchurch 8006
ZL2BIT Willan, L. R., 8 Warren Place, New Plymouth 4601
ZL2BIU McCaw, I. J., 233 Chartwell Avenue, Whangamata 2982
ZL2BJB Horne, D. A., Andon, Old Hautere Road, RD 1, Otaki 5560
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ZL2BJS Jamieson, D. R., 2 Waipuna Street, Blenheim 7301
ZL2BJU Thompson, J. J., 17 Somerset Crescent, Kapiti Village, Paraparaumu 6010
ZL2BJV Menzies, K. J., Main Road, Grovetown, Blenheim 7321
ZL2BK Simpson, G. R., 8a Faulkland Drive, Blenheim 7301
ZL2BKA Dale, J. S. A., 689 East Coast Road, Browns Bay, Auckland 1311
ZL2BKC Knowles, W. D., 10a Waiwera Crescent, Maupuia, Wellington 6003
ZL2BKE Glassey, Eve, 422 Jackson Street, Petone 6008
ZL2BKH Details unknown
ZL2BKI Hurst, J. J., 281 Te Moana Road, Waikanae 6010
ZL2BKL Allen, B. W., 239 Inland North Road, RD 43, Waitara 4656
ZL2BKN Burling, B. N. G., 11 Ted Harpur Place, Onekawa, Napier 4001
ZL2BKS Brown, K. J., 109 Belvedere Avenue, Waikanae 6454
ZL2BKW Harrowfield, T. R., RD 8, Roberts Line, Palmerston North 5321
ZL2BKY Cox, K. L., 37 Cuba Street, Petone 6008
ZL2BKZ Rodrigues, J. F. C., 4/25 Clawton Street, New Plymouth 4601
ZL2BL Beswick, D. J., 283 Happy Valley Road, Wellington 6002
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ZL2BLF Kooy, W., 39 Waiho Terrace, Porirua 6006
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ZL2BLO Moore, P. C., 8 Maxwell Place, Napier 4001
ZL2BLP Rodgers, G. K., 6 Ava Place, Christchurch 8006
ZL2BLQ Mangin, S. G., 33 West Street, Greytown 5953
ZL2BLS Lavery, M. W., 16 Morrissey Street, Hawera 4800
ZL2BLX McLauchlan, A. C. L., 81a Oxford Street, Tawa 6006
ZL2BLY Ashwell, D. H., 3/4 Barton Place, Marewa, Napier 4001
ZL2BMA Calvert, R. H. G., Fabians Road, RD 1, Greytown 5953
ZL2BMC Childs, J. R., 5 Savage Crescent, Waipukurau 4176
ZL2BMD Pearson, R. K., Rangiora holiday Park, 337 Lehmans Road, Rangiora 8254
ZL2BME Clarke, G. R., 57 Kauri Street, Miramar, Wellington 6003
ZL2BMG Details unknown
ZL2BMH Irving, J. E., 38 Lawry Street, New Plymouth 4601
ZL2BMI Sears, E. J. (Rev), 30 Lawrence Street, Havelock, Marlborough 7154
ZL2BMJ Railton-Jacks, P. N., 31 Seaforth Avenue, Palmerston North 5301
ZL2BMK Bowman, R. F., 146 Conclusion Street, Ascot Park, Porirua 6006
ZL2BML Details unknown
ZL2BMO Garrod, J., 15 Kauri Street, Edgecumbe 3082
ZL2BMP Barnes, T. H., 9a Richard Farrell Avenue, Remuera, Auckland 1005
ZL2BMR Vining, L. G., 49 Havelock Avenue, Palmerston North 5301
ZL2BMS Moore, M. B., 187 Riverside Drive, Lower Hutt 6009
ZL2BMV Hathaway, R. L. S., Address unknown
ZL2BMW Foster, P. K., PO Box 50-587, Porirua 6215
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ZL2BN Tatton, L. A., 89 First View Avenue, Beachlands, Auckland 1705
ZL2BNA Hitchman, G. J., 33 Norfolk Crescent, Feilding 5600
ZL2BNB Walker, R. A., 24 Catlins Crescent, Palmerston North 5301
ZL2BNC Cook, R. A., 50 Spencer Street, Crofton Downs, Wellington 6004
ZL2BND Smith, T. W., 4 St Johns Terrace, Tawa, Wellington 6006
ZL2BNE Marr, N. C., 7 Rothwell Place, Blenheim 7301
ZL2BNG Gibellini, J. A., 71 Point Road, Monaco, Nelson 7001
ZL2BNH Bastin, F. T., 103 Gascoigne Street, Hastings 4201
ZL2BNM McKay, P. G., 46 Rountree Street, Ilam, Christchurch 8004
ZL2BNN Robinson, H. T., 6 Becroft Drive, Forrest Hill, Auckland 1309
ZL2BNO Taylor, R. D., 21 MacLaren Street, Mangaroa, Upper Hutt 6007
ZL2BNP Details unknown
ZL2BNQ Claydon, K. W., 86 Rewa Street, Inglewood 4651
ZL2BNS Townshend, A. P., 36 Marybank Road, Atawhai, Nelson 7001
ZL2BNV Lowe, P. A., 12 Wye Street, Island Bay, Wellington 6002
ZL2BNW Walbridge, S. W., 4 St Vincent Avenue, Remuera, Auckland 1005
ZL2BNX Isherwood, K., 49 Avondale Road, Taradale, Napier 4001
ZL2BNZ Trubshaw, J. R., 363 Kimbolton Road, Feilding 5600
ZL2BO Simpson, W. N., 20 Wharepapa Grove, Motueka 7161
ZL2BOA Thorp, Marilyn, 28 Hetley Crescent, Taradale, Napier 4001

ZL2BOB Priest, B. W., 21 Winchester Street, Palmerston North 5301
ZL2BOE Large, R. A., 44 Donnelley Drive, Wainuiomata 6008
ZL2BOF Nixon, S. M., 10 Carleton Terrace, Tawa 6006
ZL2BOI Moretti, G. S., 9 Droylsden Place, Palmerston North 5301
ZL2BOJ Harris, R. E., Address unknown
ZL2BOL Biggins, B. F., 70 Lohia Street, Khandallah, Wellington 6004
ZL2BOM Phillips, O. K., 118 Long Melford Road, Palmerston North 5301
ZL2BOO Hope, M. R., PO Box 812, Blenheim 7315
ZL2BOP Bradley, R. L. (Rev), Address unknown
ZL2BOT Kennedy, S. R., 13a Aramoana Avenue, Devonport, Auckland 1309
ZL2BOU Carter, A. F., 30a Newman Avenue, Brightwater, Nelson 7151
ZL2BOV Griffiths, Anne, Main North Road, c/- Post Office, Urenui 4655
ZL2BOW Howan, A. R., 7 Almora View, Ascot Park, Porirua 6006
ZL2BOY Clarke, R. G., 3 Whitby Place, New Plymouth 4601
ZL2BPC Kuipers, E. V. (Ms), c/- 153 Nayland Road, Stoke, Nelson 7001
ZL2BPD Donovan, P. E., 389 Muritai Road, Eastbourne 6008
ZL2BPE Vennix, J. H., 89 Mitchell Street, Brooklyn, Wellington, PO Box 9029, Marion Square, Wellington 6030
ZL2BPG Harding, B. P., 6a Kawiu Road, Levin 5500
ZL2BPH Simmonds, J. H., Kahutara Road, RD 1, Featherston 5952
ZL2BPI Watt, I. D., PO Box 85, Featherston 5952
ZL2BPJ Maddock, R. H., 3 Percy Cameron Street, Avalon, Lower Hutt 6009
ZL2BPL Kerslake, M. G. R., 1 Marama Terrace, Eastbourne 6008
ZL2BPO Mainwaring, P., 413b Otumoetai Road, Otumoetai, Tauranga 3001
ZL2BPT Craw, G. J., Coupers Road, RD 3, Palmerston North 5321
ZL2BPU Goodall, R. N., 31 Plymouth Road, Flaxmere, Hastings 4201
ZL2BPX Thompson, Shirley, 8 Dampier Avenue, Palmerston North 5301
ZL2BPZ McIvor, W. G., 4 Halifax Street, Wainuiomata 6008
ZL2BQA Nield, G. S., Te Wharou Road, RD 3, Masterton 5921
ZL2BQK Hawkes Bay VHF Group, c/- L Winton, 47 Richmond Street, Napier 4001
ZL2BQL Van Loemen, E., 71 Wingate Street, Christchurch 8005
ZL2BQW McNeil, W. G., 86 Domett Street, Opunake 4854
ZL2BQX Hoogeveen, S. (Bill), 58 Burns Street, PO Box 156, Hawera 4800
ZL2BR Hunt, A. F., 8 Manu Crescent, New Plymouth 4601
ZL2BRA Cash, I. M., 77 Grey Street, Waitara 4656
ZL2BRE Details unknown
ZL2BRG Details unknown
ZL2BRI Details unknown
ZL2BRQ Grahame, K. S., 23 Marumaru Street, Marton 5460
ZL2BRS Russell, S. G., 85 Rugby Street, Palmerston North 5301
ZL2BRU Allison, R., 8 Edinburgh Street, Dannevirke 5491
ZL2BS Ward, T. W., PO Box 4127, New Plymouth 4615
ZL2BSJ Knol, W., 3/154 Onepu Road, Lyall Bay, Wellington 6003
ZL2BSL Matheson, J. D., "Karinga", West Bush Road, RD 8, Masterton 5921
ZL2BSP Lloyd, W. M., PO Box 4300, Mount Maunganui South 3030
ZL2BSQ Lawrence, R. W. C., 25 Linwood Drive, Paraparaumu 6010
ZL2BSW Gedye, E. D. M., 15 Seine Street, Island Bay, Wellington 6002
ZL2BT Gaunt, L. V. (Mrs), 28 Balliol Drive, Tawa, Wellington 6006
ZL2BTB Large, M. (Mrs), 44 Donnelley Drive, Wainuiomata 6008
ZL2BTC Rawlings, R. F., 23 Seaview Crescent, Picton 7372
ZL2BTF Budge, D. (Dr), Heroncroft, 79 Motueka Quay, Motueka 7161
ZL2BTG Woodham, R. B., 18 Goulter Street, Seddon 7353
ZL2BTH Emslie, H. H., 8b Burleigh Road, Blenheim 7301
ZL2BTJ York, K. E., 28 Cubitt Street, Blenheim 7301
ZL2BTK Willings, H. K., 27 Oxford Street, Picton 7372
ZL2BTL Steenhart, L., Address unknown
ZL2BTO Duncan, C. W., 15 Seaton Street, Atawhai, Nelson 7001
ZL2BTP Snow, R. J., 5 Rimu Street, Nelson 7001
ZL2BTQ Elwood, R. F., 44 High Street, Renwick 7352
ZL2BTU Daken, T. R., 259d Anakiwa Road, RD 1, Picton 7372
ZL2BTV Ching, G. R., 51 McLaughlan Street, Blenheim 7301
ZL2BU Biggs, R. J., 31a Elizabeth Place, New Plymouth 4601
ZL2BUI Brosnan, J., 205 Coast Road, Wainuiomata 6008
ZL2BUK Stratton, G. J., c/- 475a High Street, Motueka 7161
ZL2BVL Walker, A. G., 5 Matthews Road, Wainuiomata 6008
ZL2BW Harling, D. S., 142 Quebec Road, Nelson 7001
ZL2BWL Luke, B W, 13/83 Tait Drive, Greenmeadows, Napier 4001
ZL2BX Creswell, A. F., 36 Titiro Moana Road, Korokoro, Petone 6008
ZL2BY Smith, N. W., 16 Weka Street, Nelson 7001
ZL2BZ Dunn, A. E., 1/51 Salisbury Street, Levin 5500
ZL2BZH Banks, G. J., 6b Virginia Place, New Plymouth 4601
ZL2BZN O'Donnell, A. A., 39 Lismore Street, New Plymouth 4601
ZL2CA Vernall, R. B., 90 Campbell Street, Karori, Wellington 6005
ZL2CAT Ridge, J. D., 48 Awanui Drive, Waikanae 6454
ZL2CB Brown, C. H., 558 Wainui Road, Tamarau, Gisborne 3801
ZL2CC Mather, M. S., 17 Bloomfield Road, Gisborne 3801
ZL2CD Hamer, W. R., 187 Seatoun Heights Road, Miramar, Wellington 6003
ZL2CDH Marshall, N. R. D., 58 Fitzherbert Avenue, Wanganui 5001
ZL2CDK McCormick, C. D. K., 76 Main North Road, Westshore, Napier 4001
ZL2CDM Mills, C. D., 59 Robinson Crescent, Palmerston North 5301
ZL2CDN Dalrymple, M. B., 168 Stapleford Crescent, Browns Bay, Auckland 1311
ZL2CE Bicknell, J. A., Papawai Road, PO Box 67, Greytown 5953
ZL2CEK Details unknown
ZL2CG Cornick, M. L., 23 Oakley Avenue, Marton 5460
ZL2CH White, Allison, 6 Rinaha Place, Rotorua 3201
ZL2CHJ Golding, W. J., 78a Joll Road, Havelock North 4201
ZL2CI Sinton, A. J., 6 Chester Street, Greenmeadows, Napier 4001
ZL2CIA Details unknown
ZL2CID Morrison, N. J., 47 Leicester Street, Stoke, Nelson 7001
ZL2CJ Austin, P. H., F2/48 Masefield Street, Stoke, Nelson 7001
ZL2CJH King, M. R., 91 Lytton Road, Gisborne 3801
ZL2CJR Robertson, C. J., 23 Richmond Avenue, Karori, Wellington 6005
ZL2CL Guest, R., 24a Mizpah Road, Browns Bay, Auckland 1311
ZL2CLI McArthur, E. J. B. (Dr), PO Box 126, Carterton 5951
ZL2CN Grover, W. E., Address unknown
ZL2CNE Emke, C. N., 12 Lemon Street, Otaki 5560
ZL2CPC Sidebottom, L. W., School Road, Matemau, RD 7, Dannevirke 5491
ZL2CPR Rood, P. A., 10 Runauga Grove, Waikanae 6010
ZL2CQ Henderson, J. M., Howie Road, Fern Flats, RD 2, Marton 5460
ZL2CR Miller, N., 36 Stanley Street, Berhampore, Wellington 6002
ZL2CT Evans, Brian, South Featherston Road, RD 1, Featherston 5952
ZL2CTM Morris, C. T., 59b Ilam Road, Christchurch 8004
ZL2CV Fulton, J. M. L., 60 Shelbourne Street, Nelson 7001
ZL2CVA Adams, A. E., Address unknown
ZL2CW Gilbert, G. B., 10 Chesterton Street, Johnsonville, Wellington 6004
ZL2CWA Armstrong, C., Trelawney Crescent, New Plymouth 4601
ZL2CX Stenning, P. D., 11 Bay View Road, Atawhai, Nelson 7001
ZL2CY Details unknown
ZL2CZ Clibborn, G. H., 30 Kent Terrace, Taradale, Napier 4001
ZL2CZM Details unknown
ZL2DA Appleton, D., 19 Franklin Terrace, Havelock North 4201
ZL2DAN Leyland, D. J., 24 Seddon Street, Upper Hutt 6007
ZL2DAX Mitchell, A. R. G., 39 Birmingham Street, Palmerston North 5301
ZL2DB Brown, A. D., 154 Barnard Street, Wellington 6001
ZL2DBA Jorgensen, L. H., 291 South Road, RD 4, New Plymouth 4621
ZL2DBC Child, J., PO Box 82-109, Highland Park, Howick, Auckland 1730
ZL2DBE Peart, C. J., Burnside Road, Takaka 7172
ZL2DBO O'Donnell, Jill, 39 Lismore Street, New Plymouth 4601
ZL2DBT Marsh, H. A., 2/187 Carrington Street, New Plymouth 4601
ZL2DBX Jago, J. N., 166 Tasman Street, Opunake 4854
ZL2DC Chisholm, W. P., 1 Camellia Court, Palmerston North 5301
ZL2DCB Byron, D. C., 14 Woburn Place, Palmerston North 5301
ZL2DD Scott, D. F., 68 Chatsworth Road, Silverstream 6007
ZL2DE Johnson, D. H. (Mrs), Address unknown
ZL2DEX Muir, D. N., 5 Brighton Crescent, Palmerston North 5301
ZL2DH Welsh, J. W., 35 Beach Road, Richmond 7002
ZL2DI Shortt, J. H., 80 Savage Crescent, Palmerston North 5301
ZL2DJ Dickson, Bill, 21 Grenville Street, New Plymouth 4601
ZL2DJC Challis, D. J., 45 Berkeley Road, Wainuiomata, Wellington 6008
ZL2DJF Fox, D. J., 112 Ngamotu Road, New Plymouth 4601
ZL2DK Keenan, D. S. J., 13 Ruru Crescent, Heretaunga Park, Silverstream 6007
ZL2DL Limbrick, D. R., 45 Lynden Avenue, Northcote, Auckland 1310
ZL2DM Christian, T. C., Address unknown
ZL2DMG Gentles, D. M. A. (Mrs), 13/70 Kensington Drive, Tardale, Napier 4001
ZL2DN Lucas, D. C., PO Box 283, Pacific Harbour, Fiji
ZL2DO McMillan, R. H., PO Box 9947, Marion Square, Wellington 6030
ZL2DR Hearne, Michelle, 56 Abraham Heights, Nelson 7001
ZL2DS Horowhenua Branch, see Branch Directory
ZL2DT Cordy, J. G. G., 50 Strathmore Avenue, Wellington 6003
ZL2DU Millane, M. L., 132 Campbell Street, Karori, Wellington 6005
ZL2DUG Data Users Group, PO Box 683, Gisborne 3815
ZL2DW Walker, D, 36 Ardrossan Avenue, Flaxmere, Hastings 4201
ZL2DX Hannagan, C. C., Fire Number 6, Swamp Road, Carterton 5951
ZL2DY Parsons, A. D., 30 John Street, Upper Hutt 6007
ZL2DZF Details unknown
ZL2FA Hogan, A. V., Address unknown
ZL2FAB Burgess, F. A., 24 Island Road, Gisborne 3801
ZL2FB Hunt, R. (Mrs), 11 Lichfield Grove, Tauranga 3001
ZL2FC Coutts, C. G., 19 Konini Street, Masterton 5901
ZL2FD Butel, D., 39 Mulberry Street, Lower Hutt 6009

ZL2FE Falkner, B. A., 49 Karina Terrace, Palmerston North 5301
ZL2FF Hayward, R. S., 44 Greenwood Street, Motueka 7161
ZL2FG Torrie, A. W., 100 Blue Pacific Parade, Riversdale Beach, Via Masterton 5970
ZL2FH Garth, P. E., 101 Birrell Street, Gisborne 3801
ZL2FI Gaunt, P. J., 28 Balliol Drive, Tawa, Wellington 6006
ZL2FJ Withy, D. G., 16 Kenmore Street, Newlands, Wellington 6004
ZL2FM Burr, E. J., 87 Stanley Road, Gisborne 3801
ZL2FN Williams, E. F., 231a Mangorei Road, New Plymouth 4601
ZL2FO Hawtree, Val, 50 Fox Road, Wanganui 5001
ZL2FOX Claydon, A. C., 9/37 Selwyn Street, Tauranga 3001
ZL2FP George, S. B., 7 Te Whena Place, Waitara 4656
ZL2FQ Burgoyne, T. A., 3 Shakespeare Walk, Nelson 7001
ZL2FR Dyett, N. D., 71 Coutts Street, Wellington 6003
ZL2FS Priest, J. R., 26 Woolcombe Terrace, New Plymouth 4601
ZL2FU Hird, E. J., 61 Mantell Street, Seatoun, Wellington 6003
ZL2FV Richter, B. E., 706d Pioneer Highway, Palmerston North 5301
ZL2FW Harbridge, L. W., 20 Mascot Street, Tawa 6006
ZL2FWE Swarbrick, A., 2 Hunter Avenue, Richmond 7002
ZL2FX Billington, S. G., 28 Herbert Avenue, Palmerston North 5301
ZL2FY Harkett, R. J., 15b Alfred Street, Palmerston North 5301
ZL2FZ Reeve, R. P., 5 Eginton Street, Motueka 7161
ZL2GA Johnson, D. F. T., 7 Pinehaven Road, Upper Hutt 6007
ZL2GB Little, Allen, 7 Earl Street, Levin 5500
ZL2GC Ruane, M., 27 Norton Park Avenue, Fairfield, Lower Hutt 6009
ZL2GD Daniel, A. G., 39 Sunrise Boulevard, Tawa, Wellington 6006
ZL2GE Evans, G. R., 30 Margaret Road, Raumati Beach 6010
ZL2GEO Girling, G. F., 4 Oldfield Place, Bulls 5452
ZL2GG Smith, W. T., 17 Oxford Street, Palmerston North 5301
ZL2GH Huberts, G. H., 55 Potae Avenue, Gisborne 3801
ZL2GI Gilbert, Win, 146 Liverton Road, Belmont, Lower Hutt 6009
ZL2GIS Data Users Group, PO Box 683, Gisborne 3815
ZL2GJ Pearce, R. A. (Bob), 3 Strasbourge Street, Martinborough 5954
ZL2GK Motueka Branch NZART, see Branch Directory
ZL2GM Details unknown
ZL2GMP Pollock, G. M. (Mrs), 24 Jessie Street, Mapua 7155
ZL2GN Malabar, R. S., 9 Messenger Terrace, Oakura 4650
ZL2GO Blackley, L. C., 26 Kaitawa Crescent, Paraparaumu 6010
ZL2GQ Topliss, P. G., 7 Victoria Heights, Nelson 7001
ZL2GRI Crone, W. G., 298b Kahutia Street, Gisborne 3801
ZL2GRZ Zambon, G. R., 5 Mitre Grove, Upper Hutt 6007
ZL2GT Napier Amateur Radio Club Inc (Contest), 3 Forsyth Street, Taradale, Napier 4001
ZL2GV Hutton, J. D., 96 Waikite Road, Welcome Bay, RD 5, Tauranga 3021
ZL2GVA van Antwerpen, G., 60 Vickerman Street, Grovetown, Blenheim 7321
ZL2GWN Nicholl, G. W., 152 Breaker Bay Road, Wellington 6003
ZL2GX Details unknown
ZL2GY Taillie, L. I., 8 Findlay Street, Mangawhai 0583
ZL2GZ Panckhurst, K. D., 117 Whitaker Street, Gisborne 3801
ZL2HA Gentry, L. J. (Mrs), 8 Chudleigh Grove, Churton Park, Wellington 6004
ZL2HB Stephens, D. A., 2 Riverbend Road, Napier 4001
ZL2HBC Chandler, H. B., 34 Keith Street, Palmerston North 5301
ZL2HD Andrews, John, 66 Khandallah Road, Khandallah, Wellington 6004
ZL2HE Law, A. E., 68 Ruahine Street, Dannevirke 5491
ZL2HF French, W. B., 4 Rata Place, Masterton 5901
ZL2HI Hewer, Gloria, 115 Omata Road, New Plymouth 4601
ZL2HIS Sutherland, N., 36 Paremata Street, Atawhai, Nelson 7001
ZL2HJ Garrett, W. E., 412 Devon Street East, New Plymouth 4601
ZL2HK Wakely, J. R., 109 Mt View Road, Wanganui 5001
ZL2HM Moore, P. R., 99 Randwick Crescent, Moera, Lower Hutt 6009
ZL2HO Warner, B. A., 23 City View Grove, Harbour View, Lower Hutt 6009
ZL2HP Kendrick, T. J., 3 Ascot Street, Palmerston North 5301
ZL2HQ Harris, G. F., 15 Montana Road, Upper Hutt 6007
ZL2HR Beattie, P., 43 Gordon Street, Lower Hutt 6009
ZL2HRD Details unknown
ZL2HRL Lightwood, H. R., 137a Hospital Road, Blenheim 7301
ZL2HS Shennan, C. V., State Highway 3, PO Box 30, Turakina 5152
ZL2HT Hooker, D. D., 1a Reeve Drive, Havelock North 4201
ZL2HU Holdom, Ken A., PO Box 7, Clyde, Central Otago 9180
ZL2HV Hutt Valley Branch, see Branch Directory
ZL2HW Marsh, N. O., 16 Harris Street, Waitara 4656
ZL2HY Devenport, B., 1782 Whararata Road, RD 2, Gisborne 3821
ZL2IA Winton, L. J., 47 Richmond Street, Napier 4001
ZL2IAN Thompson, I., 8 Dampier Avenue, Palmerston North 5301
ZL2IAS Swain, I. A., 229 Riverside Drive, Waterloo, Lower Hutt 6009
ZL2IB Tararua District Radio Club, see Branch Directory
ZL2ICE Details unknown
ZL2ID Appleton, C., 52b Aquarius Drive, Rotorua 3201
ZL2IFA Andrews, I. F., 66 Shakespeare Avenue, Upper Hutt 6007
ZL2IG Tombs, E. P., 5 Nelson Street, Levin 5500
ZL2IH Hayton, Ian, PO Box 633, New Plymouth 4615
ZL2IHW White, I. H., 10 Lindaver Grove, New Plymouth 4601
ZL2II Caldwell, D. G., 88 Jubilee Road, Khandallah, Wellington 6004
ZL2IJ Eastwood, R. J., 63 Shepherd Road, Taupo 2730
ZL2IK Mulhare, P. J., 1231 Pipiwai Road, RD 6, Whangarei 0121
ZL2IL Pottinger, R. S., 32 De Menech Grove, Avalon, Lower Hutt 6009
ZL2IM Brown, P. W., 20 Nevada Drive, New Plymouth 4601
ZL2IMM McLachlan, I. M., 38 Ranfurly Street, Gisborne 3801
ZL2IN Crumpton, R. E., 27 Kapiti Crescent, Titahi Bay 6006
ZL2IO Collins, E. S., Main Road, Wakapuaka, RD 1, Nelson 7021
ZL2IOX Details unknown
ZL2IP Barnes, E. J., 790 Upper Durham Road, RD 8, Inglewood 4651
ZL2IQ Wills, M. J., PO Box 31-227, Lower Hutt 6315
ZL2IR Cuttriss, N. A., 2 Meldrum Street, Naenae, Lower Hutt 6009
ZL2IS Were, G., 180 Regan Street, Stratford 4700
ZL2IT Lilley, E. C. C., 1b Harvey Road, Napier 4001
ZL2IV Gorman, D. D., PO Box 1613, Wellington 6015
ZL2IVN Win, I. E., 4 Mimihau Grove, Wainuiomata 6008
ZL2IW Carter, R. S., 269 Ngaio Street, Rarangi, RD 3, Blenheim 7321
ZL2IX Parker, C. H., 24 Tiraumea Road, Pahiatua 5470
ZL2IZ Bartleet, J. R., PO Box 2209, Gisborne 3015
ZL2JA Wanganui Amateur Radio Society (Inc.), see Branch Directory
ZL2JAD Dunlop, J. A., 105 Kelburn Parade, Kelburn, Wellington 6005
ZL2JD Duncan, J. R., 7 Crown Hill, Onepoto, Titahi Bay 6006
ZL2JE Morison, R. D., 40 Oregon Drive, Taupo 2730
ZL2JG Anderson, G. A., 20 Leybourne Avenue, Waikanae 6010
ZL2JI Thompson, J. P., 1 Healey Place, Gisborne 3801
ZL2JJ Byam, S. P., RD 2, Waverley 5182
ZL2JK Butler, D. B., 195 Sims Road, RD, Te Horo Beach 5560
ZL2JKS Sorensen, J. K. (Miss), 57 Heta Road, New Plymouth 4601
ZL2JL Prime, D. R., 57 Waerenga Road, Otaki 5560
ZL2JN Hodder, A. A., 394 Somme Parade, Wanganui 5001
ZL2JO Lambert, N. H., 7 Sunbrae Drive, Silverstream 6007
ZL2JOE Abrahams, J. D., 1 Willis Street, Marton 5460
ZL2JON Robinson, J., 9 Watson Street, Bulls 5452
ZL2JP Sarten, C. J. (Mrs), 212 Coronation Avenue, New Plymouth 4601
ZL2JPL Watkins, A. S. R., Address unknown
ZL2JR Robertson, J., 100 Cluny Road, Plimmerton 6006
ZL2JS Black, I. W., 46 Harris Street, Marton 5460
ZL2JSB Barnes, S., 31 Brooklands Road, Nelson 7001
ZL2JT Mackie, J. B., 8 Tarata Street, Stoke, Nelson 7001
ZL2JU Details unknown
ZL2JWS Smith, J. W., 256 Waiwhetu Road, Lower Hutt 6009
ZL2JX Hodgson, E. R., 20 Colombo Street, Palmerston North 5301
ZL2JY Vincent, G. C., Motuiti Road, RD 11, Foxton 5551
ZL2JZ Jury, E. G., "Glendower", Ponatahi Road, RD 2, Carterton 5951
ZL2KA Hearne, W. R., 56 Abraham Heights, Nelson 7001
ZL2KB Kapiti Branch 69 NZART (Inc.), see Branch Directory
ZL2KBS Waterson, I. B., 4a Antonio Street, PO Box 246, Stratford 4700
ZL2KCM Mitchell, K. C., Sandridge Farm, RD 2, Marton 5460
ZL2KD Keegan, R. J., 11 Malaghan Grove, Johnsonville, Wellington 6004
ZL2KE Smith, W. A. D., 343 Devon Street West, New Plymouth 4601
ZL2KEL Birch, F. K., 1 Hosking Place, Clarks Beach, RD 4, Pukekohe 1800
ZL2KEN Dewar, D. B., 7 Richardson Avenue, Gisborne 3801
ZL2KF Fellows, S. K., 15 Fremont Grove, Upper Hutt 6007
ZL2KH Symon, Roy, 25 Annandale Street, New Plymouth 4601
ZL2KK Kerr, R. F., 78 Southgate Road, Southgate, Wellington 6002
ZL2KN Trainor, A. P. T., 118 Dimock Street, Titahi Bay, Wellington 6006
ZL2KO Manawatu Amateur Radio Society, see Branch Directory
ZL2KOT Details unknown
ZL2KP Prior, R. T., 2 Pascoe Avenue, Mana 6006
ZL2KQ Larsen, K., RD 44, Urenui 4655
ZL2KS Marlborough Branch NZART Inc., see Branch Directory
ZL2KT Brooker, R. G., Ikanui Road, Hastings 4201
ZL2KU Details unknown
ZL2KV Martin, C. J. T., 1778 Mountain Road, RD 10, Inglewood 4651
ZL2KW Betteridge, O., 8 Chambers Street, Napier 4001
ZL2KWI Manze, J. A., 10/4 Derby Street, Mt Victoria, Wellington 6001
ZL2KZ Kingston, G., 53 Tannadyce Street, Wellington 6003
ZL2LA Vivian, B., 399 Mangorei Road, New Plymouth 4601
ZL2LAB Vidulich, M. J., 219 Auckland Road, Mission View, Napier 4001
ZL2LB Milner, M. O., 21 Rangatira Road, Tawa, Wellington 6006
ZL2LC Chapman, M. A., 11 Gibbs Place, Kinloch, RD 1, Taupo 2730

ZL2LD Munn, P. M., 2 Kereru Place, PO Box 446, Masterton 5915
ZL2LDX Lauder, C. D., 118 Gemstone Drive, Parkdale, Upper Hutt 6007
ZL2LE White, Lee, 502 Huia Street, Hastings 4201
ZL2LEW Details unknown
ZL2LF Dingley, P. D., PO Box 4191, Marewa, Napier 4030
ZL2LG Dunning, S. P., 17 Kanpur Road, Wellington 6004
ZL2LJ O'Grady, P. L., 8 Cambridge Street, Tawa 6006
ZL2LK Taylor, T. J. A., 37 Riversdale Drive, New Plymouth 4601
ZL2LKS Shotton, L. K., 58a Geraldine Crescent, Palmerston North 5301
ZL2LL Sutherland, C. I., 28 Venice Street, Martinborough 5954
ZL2LM Merrick, L. F., 22 Bledisloe Avenue, Nelson 7001
ZL2LML Lovatt, L. M., 4 Awanui Street, New Plymouth 4601
ZL2LN Davenport, N. B., Richmond Road, Pohara, RD 1, Takaka 7172
ZL2LO Kerr, C. M., 30 Wakefield Street, Wanganui 5001
ZL2LQ Coote, D., 19 Corlett Road, Plimmerton 6006
ZL2LR Reid, Les, 19a Roslyn Road, Napier 4001
ZL2LUK Wilton, L. J., 88 Cornwall Street, Masterton 5901
ZL2LV Ryan, J. F., 44 Sylvan Avenue, Waikanae 6010
ZL2LW Wright, L. J., 14 Tennyson Street, Upper Hutt 6007
ZL2LX Motion, R., 2a Hazel Terrace, Cherrywood, Tauranga 3001
ZL2LY Wilson, D. J. W., 13 Kinross Street, Blenheim 7301
ZL2LZ Rumsey, J. R., 51 Freyberg Street, Lyall Bay, Wellington 6003
ZL2MAX Wheatley, M. J., 28 Wills Crescent, Ashhurst 5451
ZL2MB Montgomerie, J. C., 11 Gardiner Place, Havelock North 4201
ZL2MBS Burrell-Smith, M. L. C., 5 Kinlock Crescent, Blenheim 7301
ZL2MC Cook, M. J., 58 Hewitts Road, Woodend, North Canterbury 8255
ZL2MD Mills, C. W., 43 Great North Road, Wanganui 5001
ZL2ME Sarten, D. M., 212 Coronation Avenue, New Plymouth 4601
ZL2MF Details unknown
ZL2MG Waimarino Branch NZART Inc., see Branch Directory
ZL2MH Neal, E. W., 2a Trinity Place, Paraparaumu Beach, Paraparaumu 6010
ZL2MHB Details unknown
ZL2MHC Cairns, M. H., 4 Terrace Street, Aramoho, Wanganui 5001
ZL2MHF Details unknown
ZL2MI McCulloch, J. G., 81 Kemp Street, Kilbirnie, Wellington 6003
ZL2MIC Campkin, M. I., 25 Paritutu Road, Spotswood, New Plymouth 4601
ZL2MJ Perry, F. G., PO Box 124, Otaki 5560
ZL2ML Castles, C. R. M., 2 Kauri Street, Gisborne 3801
ZL2MLS Savage, M. L., 22 Firth Terrace, Karori, Wellington 6005
ZL2MMO Prentice, S. D., Address unknown
ZL2MN Meyer, L. H., 23 Canterbury Street, Tamatea, Napier 4001
ZL2MO Brown, N. L., 72 Kapanui Road, Waikanae 6010
ZL2MOT Moorcroft, T. K., 14 Pine Street, Gisborne 3801
ZL2MP Colley, M. J., 23 Churchill Avenue, Richmond, Nelson 7002
ZL2MQ Crook, D. J., 9 Roslyn Road, Napier 4001
ZL2MR Ryan, M. D., 147 Mahurangi East Road, Snells Beach, Warkworth 1241
ZL2MRE Potts, M. R. E., 4 Waiwera Place, New Plymouth 4601
ZL2MT Railton, G. H., 18 Old Coach Road, Johnsonville, Wellington 6004
ZL2MTH Hodgkinson, M. T., 19 Thirlmere Street, Wainuiomata 6008
ZL2MU Jupp, A. L., 147 Raleigh Street, RD 42, Waitara 4656
ZL2MUF Pawson, S. R., 239 High Street, Solway, Masterton 5901
ZL2MUI Badrick, R., 3 Sorrento Road, Silverstream, Upper Hutt 6007
ZL2MV Fail, D. G., 68 Brightwater Terrace, Palmerston North 5301
ZL2MW Details unknown
ZL2MX Lawn, M. E. (Mrs), 60b Govett Avenue, New Plymouth 4601
ZL2MZ Pool, B. L., 9 Rembrandt Avenue, Linden 6006
ZL2MZM Details unknown
ZL2NAE Hooper, D. R., 92 Savage Crescent, Palmerston North 5301
ZL2NAI Details unknown
ZL2NAX Love, J. E., 20 Bombay Street, Aramoho, Wanganui 5001
ZL2NB Barlow, F. E., 15 Sutherland Crescent, Melrose, Wellington 6003
ZL2NBJ Brown, J. R., 42 Owen Street, Newtown, Wellington 6002
ZL2NBP Rennie, P. W. G., 64 Park Terrace, Blenheim 7301
ZL2NBR Jamieson, A. D., 2 Waipuna Street, Blenheim 7301
ZL2NEK Dewar, K. D., 7 Richardson Avenue, Gisborne 3801
ZL2NF Frazer, G. C., 14 Hinton Road, Taradale, Napier 4001
ZL2NG Aked, M. S., 328 Rosetta Road, Raumati 6010
ZL2NH Bayly, R. B., 91 Lytton Road, Gisborne 3801
ZL2NI Dumbleton, G. W., 4 Stormont Place, Kingston, Wellington 6002
ZL2NJ Tarrant, P. E., PO Box 55, Wanganui 5015
ZL2NK Donaldson, B. J., 69 Takutai Avenue, Bucklands Beach, Auckland 1706
ZL2NM Stewart, H. A. S., 41 Tautahanga Road, Turangi 2751
ZL2NN Pye, Jamie, 33 Wyndham Road, Pinehaven, Upper Hutt 6007
ZL2NNA Details unknown
ZL2NO Grace, K. E., 9 Te Ara Road, Pukerua Bay 6010
ZL2NP Smith, F. J. A., 21 Otatara Road, Taradale, Napier 4001
ZL2NQ Evaroa, D. T., Appleby Road, RD 1, Drury, Auckland 1750
ZL2NR Rubery, T. F., 3 McDonald Place, Marton 5460
ZL2NS Douche, W. P., 142 Main Road, Waikanae 6010
ZL2NT Details unknown
ZL2NU Budd, L. A., 69 Tahuri Street, Manaia, Taranaki 4851
ZL2NUT Davoren, Margaret, PO Box 275, Gisborne 3815
ZL2NV Johnston, A. F., 21 Brooklands Road, Atawhai, Nelson 7001
ZL2NW Swarbrick, W. (Mrs), 2 Hunter Avenue, Richmond 7002
ZL2NX Kiwi Contest Group, c/- T. J. Hogan, 19 Ruskin Road, Newlands, Wellington 6004
ZL2NZ Milner, G. L. (Mrs), 21 Rangatira Road, Tawa, Wellington 6006
ZL2OA Wairarapa Branch NZART (Inc.), see Branch Directory
ZL2OC Lambie, W. L., 12 Foster Street, Avalon, Lower Hutt 6009
ZL2ODS Oroua Downs School, RD 11, Foxton 5551
ZL2OE Logan, D. J., 270 Manly Street, Paraparaumu Beach, Paraparaumu 6010
ZL2OF Pentelow, L. C., Kina Road, RD 31, Opunake 4854
ZL2OG Chisnall, R. R., 71 Lakings Road, Blenheim 7301
ZL2OH McMillan, W. I., 67 Bluegum Road, Paraparaumu Beach 6010
ZL2OI Leslie, Gwen, 4 Reeve Street, Foxton 5551
ZL2OJ Sainsbury, R. P., 34 York Street, Masterton 5901
ZL2OK Dickson, A. J., 193 Park Road, Palmerston North 5301
ZL2OL Sigglekow, R. W., 9 Raukawa Street, Stokes Valley 6008
ZL2OM Manning, S. C., 87a Waimea Street, New Plymouth 4601
ZL2ON Symons, R. T., PO Box 9, Picton 7372
ZL2OO Smith, A. H., Rangiotu-Rongotea Road, RD 7, Palmerston North 5321
ZL2OOO Details unknown
ZL2OR Osborne, D. O., 9 Greenock Place, Palmerston North 5301
ZL2OV Lee, W. C., 11 Henderson Street, Karori, Wellington 6005
ZL2OY Blackwood, R. L., 1 Hinau Street, Linden, Wellington 6006
ZL2OZ Taupo BBS Group, c/- 72 Hyde Avenue, Taupo 2730
ZL2PB McLaren, H. B., 10 Towai Street, Stoke, Nelson 7001
ZL2PCG Goulter, P. C., 8 Murphys Road, Blenheim 7301
ZL2PD Woodfield, A. O. J., 24 Beverley Street, St Albans, Christchurch 8001
ZL2PE Details unknown
ZL2PET Petri, A., 1a Dampier Avenue, Palmerston North 5301
ZL2PF Details unknown
ZL2PG Laird, A. K., 24 Patrick Street, Petone 6008
ZL2PH Hewer, B. J., 115 Omata Road, New Plymouth 4601
ZL2PI Treleaven, A. R., 18 Trafalgar Street, New Plymouth 4601
ZL2PJ Spellman, P. J., 36 Record Street, New Plymouth 4601
ZL2PK King-Turner, P. R., Address unknown
ZL2PKJ Johnston, P. K., 33 Mowat Street, Blenheim 7301
ZL2PL Young, C. T., 3a Princeton Road, Raumati Beach 6010
ZL2PM Coneybeer, G. B., PO Box 202, Wanganui 5015
ZL2POS Purcell, Chris, 82 Tirohanga Road, Lower Hutt 6009
ZL2PP Jack, P. F. (Mrs), 160a Waikawa Road, Picton 7372
ZL2PQ Sayer, Lynn, 49b Peach Road, Glenfield, Auckland 1310
ZL2PR Speedy, Sue, "Woodbank", Private Bag 8081, Dannevirke 5491
ZL2PRS Sutherland, P. R., 125 Russell Street, Gisborne 3801
ZL2PS Petone Technical Inst. Radio Club, (Trustee ZL2AVF), Private Bag, Petone 6332
ZL2PU Pye, J. T., 33 Wyndham Road, Pinehaven, Upper Hutt 6007
ZL2PV Molony, M., 66 Longfellow Street, Upper Hutt 6007
ZL2PW Smith, J. B., PO Box 50, Albany Village Post Centre 1330
ZL2PX Taylor, M. F. W., 16 Invergarry Road, Taupo 2730
ZL2PY Heslop, H. G., 6 Leicester Street, Stoke, Nelson 7001
ZL2PZ Waghorn, Val, 131 North Street, Feilding 5600
ZL2QA Kermeen, L. V., 8 Pony Lane, Spreydon, Christchurch 8002
ZL2QB Wenzel, K. D., RD 1, Upper Moutere 7152
ZL2QF Patea Branch NZART (Inc.), see Branch Directory
ZL2QG Brunton, W. R., 98 Hospital Road, Blenheim 7301
ZL2QK Kenny, E. J., 5 Townley Street, Te Hapara, Gisborne 3801
ZL2QM Burry, J. P. P., 13 Corry Avenue, Napier 4001
ZL2QN Burrell, G. A., 20a Tawa Terrace, Tawa 6006
ZL2QP Smith, Q. P. J., PO Box 27 090, Shirley, Christchurch 8030
ZL2QQ Details unknown
ZL2QR Abel, A. J., 20 Ranfurly Road, Feilding 5600
ZL2QX Robinson, D. M., PO Box 6147, Whakarewarewa, Rotorua 3230
ZL2QY Neilson, Pearl, c/- Atmore House, 20 Atmore Avenue, Otaki 5560
ZL2QZ Wright, B. E., PO Box 43-100, Wainuiomata 6340
ZL2RAE Details unknown
ZL2RB Thompson, C. I. N., PO Box 534, Kaitaia 0500
ZL2RD Wills, R. E., 30 City View Grove, Lower Hutt 6009
ZL2RDH Harwood, R. D., 187 Matai Road, Raumati Beach 6010
ZL2RDM Murray, R. D., 21 Derby Street, Masterton 5901
ZL2RF Fletcher, A. E., 480 Fergusson Drive, Upper Hutt 6007
ZL2RH Highman, R. E., 1/10 Rathmar Drive, Manurewa, Auckland 1702
ZL2RI Main, S. G., 24 Kingsley Street, Gisborne 3801
ZL2RIC Coleman, Ric, 12 Grundy Street, Gisborne 3801
ZL2RJ Hopgood, D. J., 33 Truscott Avenue, Johnsonville, Wellington 6004
ZL2RJF Fleming, R. J. R., RD 11, Foxton 5551
ZL2RL Berg, B. L., 8 Waikare Avenue, Lower Hutt 6009

ZL2RM Collecutt, G. P., PO Box 226, Russell 0255
ZL2RMS Details unknown
ZL2RN Royal Naval Amateur Radio Society (NZ Branch), (Trustee: ZL2TX), 20 Greenwood Boulevard, RD 1, Otaki 5560
ZL2RO Thomas, L. R., 102 Emano Street, Nelson 7001
ZL2RON Dannatt, R., 69 Beazley Crescent, Whangarei 0101
ZL2ROO Details unknown
ZL2ROS Holdaway, R. J., 21 Richardson Avenue, Blenheim 7301
ZL2ROY Sefton, R. C., 45 Newcastle Street, Palmerston North 5301
ZL2RP Leitch, A., 90 Porangahau Road, Waipukurau 4176
ZL2RPD Details unknown
ZL2RQ Details unknown
ZL2RR Stewart, B. E., 1 Caversham Road, Mosston, Wanganui 5001
ZL2RS Royal Signals Amateur Radio Society, c/- C. M. Kempson, ZL4VV, Larcombs Road, Broadfield, RD 5, Christchurch 8021
ZL2RT Jackson, H. R., Takarei Terrace, Mokau 4650
ZL2RU Rowe, I. S., 88 Washington Avenue, Brooklyn, Wellington 6002
ZL2RV Wells, R. E., Address unknown
ZL2RW White, R. S., F2/39 Rochester Street, Tamatea, Napier 4001
ZL2RX Wincer, R. A., 302 Atawhai Drive, Nelson 7001
ZL2RY Smith, S. J., 414 Ormond Road, Gisborne 3801
ZL2RZ Wall, A. M., Homewood Road, RD 12, Masterton 5921
ZL2SAM Ashton, S. J., 35 Momona Street, Wainuiomata 6008
ZL2SAW Details unknown
ZL2SB Petherick, E. R., 23 Anaru Street, Raumati Beach 6010
ZL2SD White, R. L., 74 Norbiton Road, Foxton 5551
ZL2SE De Grey, P. J., Address unknown
ZL2SET Details unknown
ZL2SF Lewis, A. W., 18 Finlay Terrace, PO Box 10-114, The Terrace, Wellington 6036
ZL2SG Wallace, Robert, 1016 Southland Road, Hastings 4201
ZL2SGT Details unknown
ZL2SIX Details unknown
ZL2SJ Norden, A. P., 14 Fernaig Street, Papakura 1703
ZL2SK Adamson, D. P., Old Kipps Road, RD 10, Palmerston North 5321
ZL2SKB Bonnington, S. K. (Miss), 170 Bridge Street, Bulls 5452
ZL2SKY Chandler, A. J., 4 Tyne Street, Palmerston North 5301
ZL2SM Smart, L. E., 48 Leslie Street, Waitara 4656
ZL2SN Black, R. B., PO Box 2222, Stortford Lodge, Hastings 4230
ZL2SQ McQuillan, H., Zagros Orchard, RD 1, Upper Moutere 7152
ZL2SR Carran, S. R., 39 Whitaker Street, Kihikihi 2430
ZL2SS Wallace, G. J., c/- 14 William Street, Lincoln 8152
ZL2ST White, S. J., 31 Bedford Road, Napier 4001
ZL2SU Harris, J. R., 21 Kokiri Crescent, Porirua, Wellington 6006
ZL2SUN Details unknown
ZL2SW Details unknown
ZL2SWR South Wairarapa Amateur Radio Club, see Branch Directory
ZL2SWZ Details unknown
ZL2SX Andrews, David, 66 Khandallah Road, Wellington 6004
ZL2SZ Pye, Gael, 33 Wyndham Road, Pinehaven, Upper Hutt 6007
ZL2TA McNearnie, K. B., 8 Dunk Place, Palmerston North 5301
ZL2TAB Hinton-Cooper, K. E., Address unknown
ZL2TAD Details unknown
ZL2TAE Saywell, I. C., RD 3, Western Lake, Featherston 5952
ZL2TAF Cookson, F. J., 25 Maymorn Road, Te Marua 6007
ZL2TAG Bennett, A. J., 9 Jasper Avenue, Mt Roskill, Auckland 1004
ZL2TAJ Squires, D. R., 6 Waipounamu Drive, Lower Hutt 6009
ZL2TAK Ingham, C. G., 138 Dowse Drive, Maungaraki, Lower Hutt 6008
ZL2TAL Gyde, R. V., 148a Pioneer Road, New Plymouth 4601
ZL2TAM Lam, J. C. S., 16 Mills Street, Eltham 4657
ZL2TAN Fairbairn, R., 49 Salisbury Road, Richmond, Nelson 7002
ZL2TAO Johnson, T. A. D., 46 Pope Street, Camborne, Plimmerton 6006
ZL2TAP Baker, W. R. E., 6 Nathan Street, Linden, Tawa 6006
ZL2TAQ Hadfield, C. I., 6 Smith Street, Paekakariki 6010
ZL2TAR Ingham, J. D., 138 Dowse Drive, Maungaraki, Lower Hutt 6008
ZL2TAS Marsh, J. K., PO Box 26, Oakura 4650
ZL2TAU Wilson, S. J., 12 Atua Street, Johnsonville, Wellington 6004
ZL2TAV Details unknown
ZL2TAW Russ, D., 153 Cracroft Street, Waitara 4656
ZL2TAY Crook, R. J., 72 Fraser Avenue, Johnsonville, Wellington 6004
ZL2TAZ Race, D. J. R., 20 Exeter Crescent, Pipimai, Napier 4001
ZL2TB Linney, E., 6 Bailey Grove, Trentham, Upper Hutt 6007
ZL2TBC Neill, S. G., 6a Burleigh Road, Blenheim 7301
ZL2TBE Simpson, K. W., 3 Milton Street, Murchison 7191
ZL2TBF Fennessy, B. G. K., 108 Norton Road, Hastings 4201
ZL2TBG Snelson, K. H., 26 The Anchorage, Whitby 6006
ZL2TBH Henderson, G. J., 30 Wisteria Grove, Lower Hutt 6009
ZL2TBI Simpson, N. M., 3 Milton Street, Murchison 7191
ZL2TBJ Laing, B. J. S., RD 1, Featherston-Martinborough Road, Longridge, Featherston 5952
ZL2TBK Love, G. A., 10 Silverstream Road, Crofton Downs, Wellington 6004
ZL2TBM Miles, B. (Mrs), 25 Fox Street, Featherston 5952
ZL2TBP Norgrove, A. E., 90 South Karori Road, Karori, Wellington 6005
ZL2TBS Ward, L. A., 11 Pinny Avenue, Lower Hutt 6009
ZL2TBU Stevens, J. E. R., 48 Chesterton Street, Johnsonville, Wellington 6004
ZL2TBW Details unknown
ZL2TBX Carson, M. R., 36a Niblett Street, Wanganui 5001
ZL2TBZ Milsom, M. A., 1d Brora Crescent, Papakowhai, Porirua 6006
ZL2TCA Poulsen, J. M., 36 Marlborough Street, Feilding 5600
ZL2TCC Brown, G. R., 28 John Street, Stokes Valley 6008
ZL2TCD Phillips, A. R. J., 7 Macey Crescent, Blenheim 7301
ZL2TCG Stipkovits, S. P., 76 View Road, Houghton Bay, Wellington 6003
ZL2TCI Details unknown
ZL2TCJ Preston, R. T., Address unknown
ZL2TCL Lacey, J. D., PO Box 30-828, Lower Hutt 6315
ZL2TCM Downs, F. W. P., 58a Chatsworth Road, Silverstream, Upper Hutt 6007
ZL2TCN Barnhill, J. D., 26 Garfield Street, Brooklyn, Wellington 6002
ZL2TCO Denton, S. B., Address unknown
ZL2TCU Milne, R. J., 16 Purser Grove, Lower Hutt 6009
ZL2TCV Bennett, M. A., 95 Karaka Street, Wanganui 5001
ZL2TCW Bonner, Craig, Peat Avenue, RD 4, Wanganui 5021
ZL2TCX Ireland, K. J., 14 Martin Harvey Street, Levin 5500
ZL2TD Preston, P. J., 29 Coolidge Street, Brooklyn, Wellington 6002
ZL2TDA Dawson, D. J., 4 Cohen Place, Milson, Palmerston North 5301
ZL2TDB Bishop, D. J., Address unknown
ZL2TDC De Grey, S. J., 9 McGuire Street, Hawera 4800
ZL2TDD Clarke, T. R., 192 Helston Road, Paparangi, Wellington 6004
ZL2TDF Dicker, J. L., Waimea West, RD, Brightwater, Nelson 7151
ZL2TDI Doney, P. A., 51c Paterson Street, Aramoho, Wanganui 5001
ZL2TDJ Boyd, Darrell, 5a Cambridge Street, Wanganui 5001
ZL2TDK Donald, A. J., 33b Burns Grove, Upper Hutt 6007
ZL2TDM Morgan, D, 1252 Fergusson Drive, Upper Hutt 6007
ZL2TDN Therkleson, G. L., 25 Marine Parade, Sorrento Bay, Eastbourne, Wellington 6008
ZL2TDO Hyde, P. R., 26 Randwick Crescent, Moera, Lower Hutt 6009
ZL2TDP Details unknown
ZL2TDQ Details unknown
ZL2TDR Gilgrist, H. T., 183 Te Moana Road, Waikanae 6010
ZL2TDS Boyd, C. B., 110 Linton Street, Palmerston North 5301
ZL2TDV Grover, D., PO Box 26-044, Newlands, Wellington 6030
ZL2TDX Simmons, P. R., Address unknown
ZL2TE Ireson, S., 57b Sunnyvale Street, Bell Block, New Plymouth 4601
ZL2TEC Bramwell, M. F., 23 Tahi Street, Mapua, Nelson 7155
ZL2TED Colgan, Ted, 55 Hyde Street, Wainuiomata 6008
ZL2TEG Griffin, E. A., 1010 Mona Street, Hastings 4201
ZL2TEL Loeffellechner, Erwin, 6 Cunliffe Street, Johnsonville, Wellington 6004
ZL2TFA Pallesen, E., 4 Burke Grove, Naenae, Lower Hutt 6009
ZL2TFB Cox, R. J. C., Address unknown
ZL2TFC Carruthers, B. M., AG Tronics, Private Bag, New Plymouth 4620
ZL2TFD Scott, W. M., 7 Kettle Avenue, Palmerston North 5301
ZL2TFF Spackman, J. M. (Mrs), 4 Colquhoun Place, Hamilton 2001
ZL2TFI Pickett, B. M., 5b Kilsythe Place, Bishopdale, Christchurch 8005
ZL2TFK Details unknown
ZL2TFN Rhodes, V. S., 46 Blagdon Road, New Plymouth 4601
ZL2TFO Brown, E. J., Address unknown
ZL2TFR Ramsay, C. G. F. (Ms), 62 Kaikoura Street, Maupuia, Wellington 6003
ZL2TFS Sears, M. E. (Mrs), 31 Ferry Road, Spring Creek, Marlborough 7350
ZL2TFT Stohr, F. A., 36a Pretoria Street, Lower Hutt 6009
ZL2TFX Fox, G. J., 18 Robert Street, Newlands, Wellington 6004
ZL2TFY Candy, D. O., Rauma Road, RD 3, Taihape 5457
ZL2TFZ Sayer, J. B., PO Box 30-159, Lower Hutt 6315
ZL2TGA Details unknown
ZL2TGB Brabant, G., 7 Konini Street, Inglewood 4651
ZL2TGC Cooke, G. J., 14 Sylvan Avenue, Waikanae 6010
ZL2TGD Dempsey, G., 423 Collinge Road, Hastings 4201
ZL2TGE Campbell, Q. D., 22 Hall Crescent, Taumarunui 2600
ZL2TGF Moore, T. E., 24 Normanby Street, Newtown, Wellington 6002
ZL2TGH Miller, G. A., 49 Te Awa Lane, RD 3, Hamilton 2021
ZL2TGK Jones, G. W., 10 John Guthrie Place, New Plymouth 4601
ZL2TGM Meads, G. T., 12 Totara Terrace, Inglewood 4651
ZL2TGN Berry, R. M., 27 Hikanui Drive, Havelock North 4201
ZL2TGQ Greenbank, R. J., 31 Somes Crescent, Newlands, Wellington 6004
ZL2TGS Leckie, G. F., 31 Tarapunga Place, Tokoroa 2392
ZL2TGU Leyton, Geoff, 54a Nicholson Road, Khandallah, Wellington 6004

ZL2TGW

ZL2TGW Clifford, K. S., 60a Pokohiwi Road, Lower Hutt 6009
ZL2TGX Morrison, J. F., 27 Mulgrave Street, Ashhurst 5451
ZL2THD Riggs, P. T., 3 Epping Grove, Karori, Wellington 6005
ZL2THE Morgan, Marie, 19 Hall Crescent, Epuni, Lower Hutt 6009
ZL2THG Mackie, A. J., 8 Tarata Street, Stoke, Nelson 7001
ZL2THI Marshall, D. W., PO Box 100, Patea 5181
ZL2THJ Gill, T. B., 69 Cambria Street, Nelson 7001
ZL2THM Hopkins, M. D., 6 Tedder Way, Karori, Wellington 6005
ZL2THO Howe, Jeff, 51 Oxford Road, Wanganui 5001
ZL2THP Dewsnap, A. V., 30 Ruru Crescent, Heretaunga, Upper Hutt 6007
ZL2THQ Newlands, R. G., 14 Vasanta Avenue, Ngaio, Wellington 6004
ZL2THV Neill, W. J., Address unknown
ZL2THW Muir, A. W., 36 Downing Street, Chartwell, Wellington 6004
ZL2THX Blanchard, D. C., 469a Egmont Road, RD 2, New Plymouth 4621
ZL2THZ Details unknown
ZL2TI Conner, D. P., 40 Marewa Road, Hataitai, Wellington 6003
ZL2TID Details unknown
ZL2TIE Guilford, A. E., 27 Rose Road, Grey Lynn, Auckland 1002
ZL2TIF Johnson, A. F. W., Address unknown
ZL2TIG Douglas, A. W. J., 20 Stanhope Grove, Korokoro, Lower Hutt 6008
ZL2TIH Harvey, Ian, 23 Munro Street, Gisborne 3801
ZL2TIK Buchanan, I. A., Motuoapa, RD 2, Turangi 2751
ZL2TIL Maxwell, D. M., 7 Plunket Avenue, Petone 6008
ZL2TIM Lumsden, K. M., 19 Taonui Street, Papakura 1703
ZL2TIQ Brieseman, P. J., 12 Franklyn Road, Tawa 6006
ZL2TIS Stewart, I., 5 Pownell Street, Masterton 5901
ZL2TIT Taylor, A. F., 16 Washington Terrace, Nelson 7001
ZL2TJA Walker, A. L., Apartment D15, Oaklands Retirement Village, Lower Queen Street, Richmong 7002
ZL2TJB Details unknown
ZL2TJC Wakely, B., 1/3 The Ridgeway, Stoke, Nelson 7001
ZL2TJG Details unknown
ZL2TJI Bould, R. M., 97 Ohariu Road, Wellington 6004
ZL2TJJ Hannon, G. J., 600 Massey Street, Hastings 4201
ZL2TJM Baker, R. E., 7 Batt Street, Palmerston North 5301
ZL2TJN Cristensen, T. G., 36 Surrey Street, Taradale, Napier 4001
ZL2TJO Brice, D., 43 Fairview Avenue, Feilding 5600
ZL2TJP Bryant, P., 62 Clarence Street, Vogeltown, Wellington 6002
ZL2TJS Strachan, J. A. M., 41 Glen Road, Kelburn, Wellington 6005
ZL2TJT Schmidt, J. T., 9 Ponderosa Grove, Maoribank, Upper Hutt 6007
ZL2TJV Details unknown
ZL2TJW Wakefield, Murray, F11 Altair Apartments, 4 East Street, Petone, Lower Hutt 6008
ZL2TJX Evans, E. T., 16 Davidson Avenue, Napier 4001
ZL2TK Garing, T. R., 7/35 Ganges Road, Khandallah, Wellington 6004
ZL2TKA Rickards, C. M., 21a Longview Drive, New Plymouth 4601
ZL2TKB Knight, K. J., 99 Chamberlain Street, Tahunanui, Nelson 7001
ZL2TKC Details unknown
ZL2TKG Wright, M. A., 28 Cunliffe Street, Johnsonville, Wellington 6004
ZL2TKH Hodges, K. J., 110 Totara Drive, Pukete, Hamilton 2001
ZL2TKI Details unknown
ZL2TKK Details unknown
ZL2TKL Thornton, W. H., RD 2, Homewood Road, Otane 4170
ZL2TKM McRoberts, K., 49 Arrow Street, Nelson 7001
ZL2TKP Fleming, A. J., 268 Courtenay Street, New Plymouth 4601
ZL2TKS Smith, K. G., c/- Westshore Motor Camp, Napier 4001
ZL2TKV Burns, F. N. R., 1010 Waipuna Street, Hastings 4201
ZL2TKW Butt, A. J., 26 Hornsey Road, Melrose, Wellington 6003
ZL2TKY Pattle, K. A., 10 Woodstock Terrace, Tawa 6006
ZL2TLC Ward, C. A. (Ms), 73 Strassburg Street, Martinborough 5954
ZL2TLD McAllister, G. B., 9 Tennyson Street, Upper Hutt 6007
ZL2TLE Ramsay, K. J., 62 Kaikoura Street, Maupuia, Wellington 6003
ZL2TLF Sargent, D. J., 9 Ngahere Street, Inglewood 4651
ZL2TLH Barber, M. B., 136 Mark Avenue, Grenada Village, Wellington 6004
ZL2TLJ Jones, B. L., 11 Turville Crescent, Newlands, Wellington 6004
ZL2TLK Roberts, L. S. (Mrs), 188 Nikau Street, Hastings 4201
ZL2TLL Wallace, D. P., 149 Orangi Kaupapa Road, Wellington 6005
ZL2TLN Nicholson, C. L., 1b/186 The Terrace, Wellington 6001
ZL2TLO O'Donnell, L A, 39 Lismore Street, New Plymouth 4601
ZL2TLR Smith, B. W., 261a Riverside Drive, Lower Hutt 6009
ZL2TLW Gifford-Moore, R. J., 2 Kaimera Court, 44a East Street, Feilding 5600
ZL2TLY Gunn, J. A., PO Box 109, Hawera 4800
ZL2TM Edwards, Ross, 4 Lewis Street, Gisborne 3801
ZL2TMA Hughes, D. C., RD 17, Waitotara, Wanganui 5021
ZL2TMB Beer, M. C. E., 109-111 Bridge Street, Bulls 5452
ZL2TMD Charlton, G. H., 136 John F Kennedy Drive, Palmerston North 5301
ZL2TME Jones, S. E., 42 Brougham Street, Nelson 7001
ZL2TMG Gore, M. C., 1 Hulme Street, Palmerston North 5301
ZL2TMI Lill, V. E., RD 1, Porirua 6006
ZL2TMM Green, J. W., 40 Bancroft Terrace, Newlands, Wellington 6004
ZL2TMQ Stewart, I. L., c/- Police Station, PO Box 1040, Whangarei 0115
ZL2TMR Norling, R. W., 94 Miro Street, Ohakune 5461
ZL2TMS Pallesen, P. A., 808 North Riverslea Road, Hastings 4201
ZL2TMU McGhie, R. C., 8 Kashmir Avenue, Upper Hutt 6007
ZL2TMV McAuliffe, P. N. G., 5 Takahe Place, Tokoroa 2392
ZL2TMW Wright, T. M., 124 Realm Drive, Glen Haven, Paraparaumu 6010
ZL2TMX Smith, C. F., 6 Rimu Place, Taradale, Napier 4001
ZL2TMY Hannan, P. E., "Tironui", RD 1, Martinborough 5954
ZL2TMZ Woodfield, N. C., 1487 Whangamata Road, RD 1, Taupo 2730
ZL2TN Brighting, T. L., 18 Ashford Avenue, Palmerston North 5301
ZL2TND Beeston, S., 39 Southgate Road, Island Bay, Wellington 6002
ZL2TNG Gibbons, N. M., 35 Matai Road, Raumati 6010
ZL2TNI Sutton, T. D., 17 Tory Street, Nelson 7001
ZL2TNM Stokes, D. C., 2/185 Cecil Road, Wadestown, Wellington 6005
ZL2TNN Dobson, H. M., 6 Haronga Road, Gisborne 3801
ZL2TNQ Plowman, T. S., 141 Thompson Road, Napier 4001
ZL2TNT Scott, G. W., RD 4, Palmerston North 5321
ZL2TNU Devon, D. R., 81 Greta Street, Oamaru 8901
ZL2TNW Earl, T. H., 148 Kelburn Parade, Wellington 6005
ZL2TO Waitara Amateur Radio Club, see Branch Directory
ZL2TOA Details unknown
ZL2TOC Atkins, P. D., 18 Apu Crescent, Lyall Bay, Wellington 6003
ZL2TOD Details unknown
ZL2TOE Graham, P. R., 23 Woodville Street, St Albans, Christchurch 8001
ZL2TOF Vincent, P. C., 7 Pharazyn Street, Feilding 5600
ZL2TOH Fulton, J. E. R., 22a Trelissick Crescent, Ngaio, Wellington 6004
ZL2TOO Details unknown
ZL2TOP Coley, N., 84 Main Road, Wainuiomata 6008
ZL2TOR Woods, D. J., RD 5, Ngaio Road, Feilding 5600
ZL2TOS Anderson, K. J., 215 Stokes Valley Road, Stokes Valley 6008
ZL2TOU Brunton, R. G., 19 Gladstone Street, Woodville 5473
ZL2TOZ O'Donnell, M. J., 9 Coles Crescent, Papakura 1703
ZL2TPC Details unknown
ZL2TPD Tingey, S. A., PO Box 11-477, Manners Street, Wellington 6034
ZL2TPE Clarke, G. E. (Mrs), 57 Kauri Street, Miramar, Wellington 6003
ZL2TPF Manley, P. F., 6 Sunshine Avenue, Paraparaumu 6010
ZL2TPG Gilbert, S. A., 1 King Street, Napier 4001
ZL2TPH Hellberg, Mrs Penny, 96 Kelvin Grove Road, Palmerston North 5301
ZL2TPJ Jardine, B. J., Ashurst Bunnythorpe Road, RD 10, Palmerston North 5321
ZL2TPL Laing, P. D., 6 McDonald Street, Taita, Lower Hutt 6009
ZL2TPO Jackson, C. D., Surrey Satellite Technology Ltd, University of Surrey, Guildford, England GU2 5XH
ZL2TPP Caldwell, J. D., c/- 7 Evergreen Way, Nelson 7001
ZL2TPQ Browning, K. F., 56 Cole Street, Dannevirke 5491
ZL2TPR Roulston, P. R., 7 Arundel Grove, Upper Hutt 6007
ZL2TPS Purdie, B. E., 65 Hedges Street, Sanson 5450
ZL2TPT Harris, H. B., "Mt Adde", RD 4, Blenheim 7321
ZL2TPW Annett, D. A., Address unknown
ZL2TPX Hopkins, C., 75 Dimock Stret, Titahi Bay 6006
ZL2TPY Mundell, K. W., 6 Alberta Road, New Plymouth 4601
ZL2TQA Nixon, P. J., 1 Marama Terrace, Days Bay, Eastbourne 6008
ZL2TQD Fulton, H. R., 13 Staysail Place, Whitby, Paremata 6006
ZL2TQI Tucker, N. R. A., 17 Sefton Street, Havelock North 4201
ZL2TQK Maxwell, C. H., 8 Martin Grove, Lower Hutt 6009
ZL2TQP Quinn, C. J., 29 Dominion Park Street, Johnsonville, Wellington 6004
ZL2TQQ Hill, H. R., 3a Balliol Drive, Tawa 6006
ZL2TQR Details unknown
ZL2TQV Details unknown
ZL2TR Dallimore, S. C., 26 Marybank Road, Atawhai, Nelson 7001
ZL2TRB Johnson, Vicki, 19 Thirlmere Street, Wainuiomata 6008
ZL2TRE Jennings, S. B., 66 Pine Avenue, Upper Hutt 6007
ZL2TRH Darby, P. R., 25 South Road, New Plymouth 4601
ZL2TRJ Nicoll, R. J., 25 Selwyn Street, Wither Rise, Blenheim 7301
ZL2TRL Jarvis, M. D., 130 Kelvin Grove Road, Palmerston North 5301
ZL2TRM MacKenzie, H. R., 23 Balgownie Avenue, Wanganui 5001
ZL2TRQ McKenzie, N. A., 1 Colenso Avenue, Napier 4001
ZL2TRR Cameron, H. K., 6 Somerset Grove, Waitarere Beach 5500
ZL2TRT Details unknown
ZL2TRV Yaldwyn, J. S. C., 107 Kanpur Road, Broadmeadows, Wellington 6004
ZL2TRW Watson, R. H., 44 Orr Crescent, Lower Hutt 6009
ZL2TRZ Tonkin, J. R., 15 Ahuriri Street, Strathmore Park, Wellington 6003
ZL2TSA Bold, M. R., 162 West Street, Feilding 5600
ZL2TSD Keen, N. K. M., PO Box 484, Whakatane 3080

ZL2TSE Thompson, A. B. J., 104 Innes Road, Christchurch 8005
ZL2TSF Chisholm, W. J. R., 13/131 Coromandel Street, Newtown, Wellington 6002
ZL2TSH Codd, B. A., Address unknown
ZL2TSI Allison, D. N., 49 Oregon Drive, Queenstown, Postal: PO Box 1066, Queenstown 9197
ZL2TSJ Jardine, Shirley, Ashhurst Bunnythorpe Road, RD 10, Palmerston North 5321
ZL2TSK Millard, G., 30 Akatarawa Road, Upper Hutt 6007
ZL2TSL Laybourn, B. J., 146 Pembroke Road, Wellington 6005
ZL2TSM Brown-Douglas, F. A., PO Box 10-133, The Terrace, Wellington 6036
ZL2TSN Parker, G. T., 2/46 Highland Park Drive, Howick 1705
ZL2TSO Osborne, S. J., 14 Abbots Avenue, Waipawa 4170
ZL2TSP Salt, B. R., 514a Fenwick Street, Hastings 4201
ZL2TSQ Details unknown
ZL2TSR Meharry, A. G., 18 Puriri Street, Te Aroha 2971
ZL2TSS Tse, A. E., PO Box 11-263, Ellerslie, Auckland 1131
ZL2TST Bernon, B. A., 7 Spur Grove, Titahi Bay 6006
ZL2TSY Wilson, K. J. (Miss), 13 Kinross Street, Blenheim 7301
ZL2TTA McNeil, I. J., 111 Norana Road, Upper Hutt 6007
ZL2TTB Details unknown
ZL2TTC Adamson, F. R., 16 Naughton Terrace, Kilbirnie, Wellington 6003
ZL2TTE Crampton, J. F., 40 Rogers Street, Blenheim 7301
ZL2TTF Christianson, N. J., 8 Rankin Street, Wadestown, Wellington 6001
ZL2TTK Gridley, N. J., 11 Humphries Street, Greytown 5953
ZL2TTL Watkins, K. R., 19a Carthew Street, Okato 4652
ZL2TTQ Clark, L. K., Roberts Line, RD 8, Palmerston North 5321
ZL2TTS Jansen, C. T. F., 10 Karepa Street, Brooklyn West, Wellington 6002
ZL2TTX Walker, R. S., 9 Milne Terrace, Island Bay, Wellington 6002
ZL2TTY Boyce, M. L. P., PO Box 4170, Palmerston North 5315
ZL2TU Adin, B. E., 18 Duke Street, Levin 5500
ZL2TUA Details unknown
ZL2TUD Futter, R. J., PO Box 38-662, Wellington Mail Centre 6332
ZL2TUE Wall, R. J., PO Box 451, Gisborne 3815
ZL2TUF Hastie, L. M., Koputara Road, Himatangi Beach, RD 11, Foxton 5551
ZL2TUI Bergen, E. A., 4 Armagh Terrace, Marton 5460
ZL2TUO Davies, J. R., PO Box 238, New Plymouth 4615
ZL2TUQ Cuttriss, H. N., 75a Tiber Street, Wellington 6002
ZL2TUR Banks, M., 66 Cumberland Street, New Plymouth 4601
ZL2TUS Kirkness, M. A., 54 Rimu Street, Wanganui 5001
ZL2TUT McPherson, D. B., Address unknown
ZL2TUU Davis, R. W., 10 Maire Street, Otaki 5560
ZL2TUV Jepson, S. J., Forest Lakes Road, RD, Otaki 5560
ZL2TUW Humphreys, E. M., 16 Fergusson Street, Stoke, Nelson 7001
ZL2TUY Prankerd, D. G., Takapu Road, Johnsonville, Wellington 6004
ZL2TV Boyer, J. P., 21a Wainui Street, Nelson 7001
ZL2TVA Burney, G. L., 125 Knights Road, Lower Hutt 6009
ZL2TVB Seed, B. V., Peka Peka Road, RD, Waikanae 6010
ZL2TVG Buck, G. K., 96 Cleghorn Street, Blenheim 7301
ZL2TVJ Bodley, R. A., PO Box 6740, Marion Square, Wellington 6030
ZL2TVK Hill, K. M. (Miss), 29 Holdsworth Avenue, Upper Hutt 6007
ZL2TVM Cross, Gavin, 52 Cudby Street, Lower Hutt 6009
ZL2TVO Scott, P. A. L., 28 Jefferson Place, Brookfield, Tauranga 3001
ZL2TVP Eden, A. D., 5 Norwich Street, Stoke, Nelson 7001
ZL2TVV Newland, P. B., 25a Tawa Terrace, Tawa 6006
ZL2TVX Cooke, R. J., 9 Gaff Place, Whitby, Porirua 6006
ZL2TVY Smith, R. L., PO Box 7120, Wellington South 6039
ZL2TVZ Janes, P. A. F., PO Box 1871, Whangarei 0115
ZL2TWB Fell, L. J., 6 Samuel Street, Hoon Hay, Christchurch 8002
ZL2TWF Details unknown
ZL2TWJ Details unknown
ZL2TWK Siddall, R. M., 24 Blue Gum Rise, Pakuranga, Auckland 1706
ZL2TWL Details unknown
ZL2TWM Wilson, C. I., 11 Ashton Terrace, Castlecliff, Wanganui 5001
ZL2TWN Foubister, M. W., 23 Chadwick Place, Palmerston North 5301
ZL2TWO Jennings, J. P. H., 5 Cara Crescent, Paparangi, Wellington 6004
ZL2TWP Aimers, A. G., Boyce Street, Renwick 7352
ZL2TWQ Fryer, R. J., "Tironui", RD 1, Martinborough 5954
ZL2TWS Wysocki, J. M., 115a Epuni Street, Lower Hutt 6009
ZL2TWT Purton, S. D., 376 Botanical Road, Palmerston North 5301
ZL2TWX Simmonds, D. H., Address unknown
ZL2TWZ Murphy, P. C., 274 Songer Street, Stoke, Nelson 7001
ZL2TX Hardy, N. A. T., 20 Greenwood Boulevard, RD 1, Otaki 5560
ZL2TXE Waters, R. J., 32 Taft Street, Brooklyn, Wellington 6002
ZL2TXF Heal, E. J., 19 Simons Street, New Plymouth 4601
ZL2TXG Details unknown
ZL2TXJ Hoare, M. F., 158 Mark Avenue, Grenada, PO Box 1883, Wellington 6015
ZL2TXK Duncan, G. R., 59 Harold Holt Avenue, Onekawa, Napier 4001
ZL2TXL Eastergaard, A. G., PO Box 31-390, Lower Hutt 6315
ZL2TXP Prentice, A. J., Address unknown
ZL2TXT Cleland, W. J., 212 Ferguson Street, Palmerston North 5301
ZL2TXV Baldwin, A. N., 8 Hobson Place, Palmerston North 5301
ZL2TXX Penney, B. J., 49 Fergusson Street, Stoke, Nelson 7001
ZL2TY Conroy, T. J., 12/17 Britannia Street, Petone 6008
ZL2TYB Lockyer, R. H., 11 Trevelyan Street, Napier 4001
ZL2TYD Good, C. L., 80 Waimumu Road, Massey, Auckland 1008
ZL2TYJ Symon, M. D., 27 Howard Road, Taradale, Napier 4001
ZL2TYM Henrard, E. A. M., 6 Baillie Crescent, Carterton 5951
ZL2TYO Fitzsimons, B. J., Address unknown
ZL2TYR Robertson, D. R., 15 Sailmaker Close, Whitby 6006
ZL2TYT Wilde, R. G., 421 Kimbolton Road, Feilding 5600
ZL2TYU Abernethy, R. J., 40a Peterhouse Street, Tawa, Wellington 6006
ZL2TYZ Bell, G. R., Elsthorpe, RD 2, Otane, Napier 4170
ZL2TZ Bould, J. R., 13 Lichfield Crescent, Tamatea, Napier 4001
ZL2TZE Conza, P. J., 4 McFarlane Place, Blenheim 7301
ZL2TZG Sargent, Gail, 9 Ngahere Street, Inglewood 4651
ZL2TZH Helson, N. G., McLaughlins Road, Darfield, RD 1, Christchurch 8172
ZL2TZV Sutton, P. R., 7 Curling Crescent, Maraenui, Napier 4001
ZL2TZW Miles, I. D., 25 Fox Street, Featherston 5952
ZL2TZX Hoskins, R. H., 25 Ludlam Crescent, Lower Hutt 6009
ZL2UAA Bissett, W. L., c/- Tinopai Store, Tinopai, Matakohe 0584
ZL2UAF Hill, M., 25a Woodmancote Road, Khandallah, Wellington 6004
ZL2UAG Gilbert, A. C., 54 Rutherford Road, Marewa, Napier 4001
ZL2UAJ Newell, M. C., 21 Joseph Street, Palmerston North 5301
ZL2UAL Huberts, K., 16 Wairere Road, PO Box 6, Gisborne 3815
ZL2UAN Wills, A. R., 30 City View Grove, Lower Hutt 6009
ZL2UAO Murphy, G. R., 274 Songer Street, Stoke, Nelson 7001
ZL2UAS Slater, D. J., 35 Wyndham Road, Ashhurst 5451
ZL2UAW James, A. R., 413 Frederick Street, Hastings 4201
ZL2UAY Terris, C. A., Address unknown
ZL2UB Lowe, J. M., 23 Te Whiti Grove, Korokoro, Petone 6008
ZL2UBA Maitland, I. J., PO Box 743, Wanganui 5015
ZL2UBB Gibson, R. I., 31 Hobart Street, Miramar, Wellington 6003
ZL2UBG Lowes, C. W., 27 St Hill Lane, Havelock North 4201
ZL2UBH Cole, L. R., 8 London Road, Korokoro, Petone 6008
ZL2UBI Terris, R. D., 45 Marlowe Street, Stoke, Nelson 7001
ZL2UBJ Curran, B. I., c/- Blockhouse, Pungarehu Road, Pungarehu 4855
ZL2UBK Webber, D., 4 Victory Crescent, Tawa 6006
ZL2UBM Taylor, G. J. W., Hammericks Road, RD 3, Blenheim 7321
ZL2UBN Briggs, A. G., 580 Lowe Street, Hastings 4201
ZL2UBO Grenfell, S. K. (Mrs), Address unknown
ZL2UBP Riordan, I. M., c/- Takaka Post Shop, Takaka 7172
ZL2UBQ Freer, R. I. R., Address unknown
ZL2UBS Scott, G. H., 140 Epuni Street, Lower Hutt 6009
ZL2UBT Details unknown
ZL2UBU Howie, I. M. C., 9 Trelissick Crescent, Ngaio, Wellington 6004
ZL2UBW Details unknown
ZL2UBZ Gaudin, G. W., 12 Ada Place, Fairview Downs, Hamilton 2001
ZL2UCA Gilchrist, R. J., 61 Heta Road, New Plymouth 4601
ZL2UCD Calvert, D. A. (Ms), Fabians Road, RD 1, Greytown 5953
ZL2UCE Hursthouse, D. E., 24 Duart Road, Havelock North 4201
ZL2UCG Birchall, O. J., PO Box 4505, Palmerston North 5315
ZL2UCH Marshall, L., 37 Turoa Road, Wanganui 5001
ZL2UCI Rawdon, P. D., 9 Curzon Place, Parklands, Christchurch 8009
ZL2UCJ Birt, K. J., 4 Te Ngaere Place, Merrilands, New Plymouth 4601
ZL2UCN Goldsworthy, D. A., 165 Pembroke Street, New Plymouth 4601
ZL2UCS McPherson, M. E. (Mrs), 60 Wakawa Road, Picton 7372
ZL2UCT Oborn, D. E., 68 Pembroke Road, Northland, Wellington 6005
ZL2UCW Bray, D. K., 35 Wavell Crescent, Masterton 5901
ZL2UCX Davis, Steve, PO Box 120, Christchurch 8015
ZL2UDA Barnes, B. R., 47 Eastown Road, Wanganui 5001
ZL2UDB Learmonth, B. H., Main Road, Kopane, RD 6, Palmerston North 5321
ZL2UDC Lockie, D. C., 70 Cashmere Avenue, Wellington 6004
ZL2UDD Reese, L. W. J., 50 Harold Holt Avenue, Napier 4001
ZL2UDE Senior, R. J., 34 Lahore Street, Wairoa 4192
ZL2UDF Wheeler, M. B., PO Box 39 079, Wellington Mail Centre 6332
ZL2UDO Nield, P. J., 115 Holly Street, Avondale, Auckland 1007
ZL2UDR Cole, G. P., 58 Woodhouse Avenue, Wellington 6005
ZL2UDS Stuart, D. J., 36 Porutu Street, Lower Hutt 6009
ZL2UDT Details unknown
ZL2UDV Lambert, J. (Mrs), 7 Konini Street, Masterton 5901
ZL2UDX Lawn, M. J., 2 Kiwi Place, Tawa, Wellington 6006
ZL2UDY Heywood, B., PO Box 3120, Greerton, Tauranga 3030
ZL2UEB Fuchs, F. W., 51a Singers Road, Korokoro, Lower Hutt 6008
ZL2UEC Packer, B. A., 10 Patna Street, Ngaio, Wellington 6004
ZL2UEF Whittaker, J. W., 24a Shackleton Grove, Stokes Valley, Lower Hutt 6008

ZL2UEG Thorp, R. J., 26 Southwark Avenue, Tamatea, Napier 4001
ZL2UEI McConnell, W. K., 15 Hinton Avenue, Hamilton 2001
ZL2UEL Evans, Rita, 30 Margaret Road, Raumati Beach 6010
ZL2UEQ Harris, R. H., 43a Cameron Road, Napier 4001
ZL2UET Wardell, D. M., 43 Rangitoto Terrace, Milford, Auckland 1309
ZL2UEW Aurisch, P. J., PO Box 58, Taupo 2730
ZL2UEZ Dow, A. J., 25 Robertson Street, Upper Hutt 6007
ZL2UF Arthur, D. B., 51 Maraetai Heights Road, Maraetai 1705
ZL2UFA Details unknown
ZL2UFC Details unknown
ZL2UFE Vickers, M. P., Eltham Road, RD 21, Stratford 4700
ZL2UFH Huntingdon, R. J., Address unknown
ZL2UFI Gooding, M. S., Address unknown
ZL2UFJ Baker, G. C., 101 Hinewa Road, Tauranga 3001
ZL2UFP Cordy, M., 32 David Crescent, Karori, Wellington 6005
ZL2UFR Gibson, B. S., 19 Rothesay Lane, Bethlehem Heights, Tauranga 3001
ZL2UFS Kent, A. A., 7 House Avenue, Mangere Bridge, Auckland 1701
ZL2UFW Baldwin, T. N., 158 Raleigh Street, RD 42, Waitara 4656
ZL2UFZ Shore, R. I., Sandspit Road, RD 2, Warkworth 1241
ZL2UGB Brenchley, G. C., 58 Diaz Drive, Flaxmere, Hastings 4201
ZL2UGC Clark, B. A., 15 Deller Drive, Carterton 5951
ZL2UGD Dillon, J. P., 7 Wilford Street, Lower Hutt 6009
ZL2UGF Nicolson, A., 12 Southern Cross Crescent, Island Bay, Wellington 6002
ZL2UGG Syme, D. R., 17 Rogers Road, Bay View, Napier 4151
ZL2UGH Newport, C. W., 162 Kawai Street South, Nelson 7001
ZL2UGL Southam, J. E., 17a Pimlico Place, Newlands, Wellington 6004
ZL2UGM Thomson, B. J., 16 Victory Crescent, Tawa 6006
ZL2UGN Gregory, B., 6 Cobham Street, Levin 5500
ZL2UGP Pears, D. M., 173a Te Moana Road, Waikanae 6010
ZL2UGR Smith, P. R., Unit 1, 53 Clifford Road, Johnsonville, Wellington 6004
ZL2UGS Jones, B. R., 4800 SH3, RD 3, Ohaupo 2452
ZL2UGV Senior, J. I. M. (Mrs), 34 Lahore Street, Wairoa 4192
ZL2UHF Details unknown
ZL2UHH McGowan, D. W., 18a Bell Street, Wanganui 5001
ZL2UHJ Tevendale, H. M. (Ms), 9 Moana Road, Plimmerton 6006
ZL2UI Bailey, I. L., 42 Catlins Crescent, Palmerston North 5301
ZL2UIA Lipski, K., PO Box 7454, Wellington South 6039
ZL2UIB Morrish, I. D., 5a Woodridge Drive, Newlands, Wellington 6004
ZL2UIH Briggs, Glen, 580 Lowe Street, Hastings 4201
ZL2UIN Gregory, A., 6 Cobham Street, Levin 5500
ZL2UIO Mannering, W. L., 8 Glastonbury Drive, Burwood, Christchurch 8009
ZL2UIV Candy, S. T. R., PO Box 56-072, Tawa, Wellington 6230
ZL2UIY Gorman, Tim, RD 31, Levin 5500
ZL2UJ Sadgrove, P. C., 37 King Street, Cambridge 2351
ZL2UJH Roberts, W. S., 188 Nikau Street, Hastings 4201
ZL2UJK Kyle, J. P., PO Box 26-525, Epsom, Auckland 1030
ZL2UJL Riden, C. P., The Loop, Riverbend Road, Napier 4001
ZL2UJM Manuel, J. D., 24 Avenue Road, Greenmeadows, Napier 4001
ZL2UJN Sinclair, N. J., 8 Kapu Grove, New Plymouth 4601
ZL2UJP McCulloch, G. L. (Mac), Koromiko, RD 3, Blenheim 7321
ZL2UJS Sinclair, J. J. (Mrs), 8 Kapu Grove, New Plymouth 4601
ZL2UJT Jury, Ngaire, 12 Aubrey Street, New Plymouth 4601
ZL2UJW Warriner, J. R. K., 3 Christopher Way, Paparangi, Wellington 6004
ZL2UKA Makawe, T. D. J., 27 Clifton Drive, Waitara 4656
ZL2UKD Fleming, T. A., 1 Matai Place, Pahiatua 5470
ZL2UKE Williams, J. P., 25a Ikitara Road, Wanganui 5001
ZL2UKH Henderson, K. H., 30 Vaucluse Avenue, Paraparaumu 6010
ZL2UKO Wilson, C. J., Ranzau Road, RD 1, Richmond, Nelson 7031
ZL2UKR Roberts, S. A., 84 Bell Street, Featherston 5952
ZL2UKS Prentice, N. C., 79 Nottingham Street, Karori, Wellington 6005
ZL2UKT Hughes, C. M., 741 High Street, Lower Hutt 6009
ZL2UKV Thompson, D. A., 87 Norton Park Grove, Lower Hutt 6009
ZL2UKW Prior, M. S., Junction Road, RD 7, Feilding 5600
ZL2UKX Hale, R. E., 23 Bellringer Crescent, Newlands, Wellington 6004
ZL2UKY Vowell, D. J., PO Box 11-956, Manners Street, Wellington 6034
ZL2UKZ Clapcott, P. J., Apt 8J/12-36 Wakefield Street, Auckland 1001
ZL2UL Lyford, A. W., 8 Roto Street, Tahunanui, Nelson 7001
ZL2ULA Ofsoski, J, 8 Wayside, Mirarmar, Wellington 6003
ZL2ULB Martin, G., 5 Atherstone Lane, Belmont, Lower Hutt 6009
ZL2ULC Newson, I. S., 9 Mercury Way, Whitby, Wellington 6006
ZL2ULD Lennox, B. T., 40 Kanpur Road, Broadmeadows, Wellington 6004
ZL2ULG Toorenburg, L. M. L., 459 Durham Street, Christchurch 8001
ZL2ULI O'Neill, A. H., 7 Gresham Place, Knightsbridge, Napier 4001
ZL2ULJ Campbell, M. H., 65 Point Road, Monaco, Nelson 7001
ZL2ULK Etchells, D. J., 36 Avro Road, Whitemans Valley, Upper Hutt 6007
ZL2ULM Details unknown
ZL2ULN Bruckel, P., Address unknown
ZL2ULO Lawson, C. (Mrs), 114 Hospital Road, Blenheim 7301
ZL2ULP Tennent, S. W., 8 St Clio Street, Christchurch 8004
ZL2ULR Details unknown
ZL2ULS Details unknown
ZL2ULT Taylor, G. R., 105 Waikawa Road, Picton 7372
ZL2ULU Elvy, J. M., "Larksfield", 034 St Leonards Road, RD 1, Blenheim 7321
ZL2ULV Allan, P. D., 20a Courtney Street, Motueka 7161
ZL2ULW Rice, L. J., 67 Wither Road, Blenheim 7301
ZL2ULX Buckton, L. (Mrs), 44 McLauchlan Street, Blenheim 7301
ZL2ULY Meffan, P. M., 595 Rocks Road, Nelson 7001
ZL2ULZ Details unknown
ZL2UMB Details unknown
ZL2UMF Wallace, Brenda, 578/1 Fergusson Drive, Upper Hutt 6007
ZL2UMJ Robinson, S. T., 37 Beachville Crescent, Nelson 7001
ZL2UMN Mantell, R. A. (Mrs), 163a Broderick Road, Johnsonville, Wellington 6004
ZL2UMR Details unknown
ZL2UMW Details unknown
ZL2UN Robinson, C. B., 58 Denbigh Road, Feilding 5600
ZL2UNB Details unknown
ZL2UNH Details unknown
ZL2UNJ Wylie, E. J., 175 Warspite Avenue, Porirua, Wellington 6006
ZL2UNK Kato, N., 75a Waterloo Crescent, Palmerston North 5301
ZL2UNS Details unknown
ZL2UNW Roberts, B. G., 4 Glenamoy Crescent, Johnsonville, Wellington 6004
ZL2UNX Boniface, N. J., 163 Colombo Road, Masterton 5901
ZL2UO Terezow, T., 25 Magnolia Grove, Maungaraki, Lower Hutt 6008
ZL2UOB Details unknown
ZL2UOJ Details unknown
ZL2UOL Levick, A. H., 17 Mascot Street, Tawa, Wellington 6006
ZL2UPB Brooks, P.M., 33 Hotham Street, Murchison 7191
ZL2UPF Francis, S. P., 57 Heta Road, New Plymouth 4601
ZL2UPG Dixon, M. T. R., 6 Kelly Grove, Upper Hutt 6007
ZL2UPP Details unknown
ZL2UQ Williams, R. C., 10a Stuart Street, Levin 5500
ZL2UQI Coombe, H. W., 31 Linklater Avenue, Foxton Beach 5551
ZL2UQU Hernandez, M., 10a Duncan Street, Tawa, Wellington 6006
ZL2UR Lockie, H. A., 70 Cashmere Avenue, Wellington 6004
ZL2URJ Details unknown
ZL2URN Christensen, J. H., Fernhill, Mt Bruce, RD 1, Masterton 5921
ZL2US Benis, H. G., 165 Rosetta Road, Raumati Beach 6010
ZL2USB Hunter, Graham, 135 Brook Street, Nelson 7001
ZL2USC Details unknown
ZL2USG Details unknown
ZL2USJ Francis, B., 31 Clemow Road, New Plymouth 4601
ZL2USM Fox, A. C. K., 37 St Johns Terrace, Tawa, Wellington 6006
ZL2USS Holden, G. D., 34 Middleton Road, Johnsonville, Wellington 6004
ZL2USV White, P. S., 32 Tarena Street, Mamaku 3250
ZL2UT Davoren, Bas, PO Box 275, Gisborne 3815
ZL2UTA Hounsell, L. K., 16 Brunswick Road, Wanganui 5001
ZL2UTF Duoba, V., Mountain Road, RD 10, Tariki 4651
ZL2UTG Hill, A. N., 445 Ruahine Street, Palmerston North 5301
ZL2UTI Murphy, M. P., 34 Nelson Street, Waipukurau 4176
ZL2UTL Williams, D. S., 156 Main Road, Wainuiomata 6008
ZL2UTN Stewart, J. E., 11a Hartford Crescent, Totara Park, Upper Hutt 6007
ZL2UTR Francis, A. (Mrs), 31 Clemow Road, Fitzroy, New Plymouth 4601
ZL2UTV Ayers, D., 17 Fernhaven Grove, Newlands, Wellington 6004
ZL2UU Tolley, H. G. R., 28a Essex Street, Masterton 5901
ZL2UV Kibble, A. R., Horokiwi Hill, PO Box 33-232, Petone 6340
ZL2UW Naulls, R. D., 119 Arthur Crescent, Taupo 2730
ZL2UWJ Jacobsen, W. J., 10 Empire Street, Dannevirke 5491
ZL2UWY Laybourn, R. A., 146 Pembroke Road, Northland, Wellington 6005
ZL2UWZ Norman, A. J., 4a Freyberg Crescent, Waikanae Beach 6010
ZL2UX MacDonald, J. R., 39 Aniseed Grove, Upper Hutt 6007
ZL2UXP Details unknown
ZL2UYH Gusscott, N. T., 4 Penrose Street, Lower Hutt 6009
ZL2UZ Spotswood College, c/- Trustee B P Finch ZL2BBN, PO Box 6116, Moturoa, New Plymouth 4630
ZL2UZG Wood, L. R. L., 118 Browne Street, Waitara 4656
ZL2UZP Details unknown
ZL2UZQ Allen, A. J., 8 Shaftesbury Grove, Stokes Valley 6008
ZL2UZY Eustace, R. W., 19 Rapaki Street, RD 11, Turakina Beach 5152
ZL2VA Vaughan, D. L., 70 Glen Road, Raumati South 6010
ZL2VAF Newson, J. R., 807a Gordon Road, Hastings 4201
ZL2VAH White, G., 807 Kowhai Street, Hastings 4201
ZL2VAL Leech, A., 1/50 Queens Road, New Plymouth 4601
ZL2VAR Anderson, G. A., 30 Titoki Street, Masterton 5901

ZL2VAU Hellberg, D. J., 96 Kelvin Grove Road, Palmerston North 5301
ZL2VAV Hawtree, N. R., 50 Fox Road, Wanganui 5001
ZL2VAX Fleming, P. A., Riverland Farm, RD 2, Pahiatua 5470
ZL2VB Browne, A. H., 98 Renown Road, Raumati South 6010
ZL2VBH Details unknown
ZL2VBI Allan, G. (Mrs), 20a Courtney Street, Motueka 7161
ZL2VBJ Bromley, S. J. (Mrs), 9 Archer Place, Carters Beach, Westport 7621
ZL2VBK Rozee, F. P., 53 Dillon Street, Blenheim 7301
ZL2VBO Goodger, G. W., 5 Dodson Road, Takaka 7172
ZL2VBT Kemsley, T. R., 100 Pitcairn Street, Oakura 4650
ZL2VBV van Beek, Guy, 16 Norwich Place, Palmerston North 5301
ZL2VC Johnson, C., 2/3 Tarbet Place, Flaxmere, Hastings 4201
ZL2VCA Palmer, D. G., 4 Tuckett Place, Wakatu, Nelson 7001
ZL2VCC Wheatley, Cheryl, 28 Wills Crescent, Ashhurst 5451
ZL2VCH Herbert, C. A. (Mrs), 860 Mataro Road, RD 45, Urenui 4655
ZL2VCM Details unknown
ZL2VCR Details unknown
ZL2VDB Bolt, D. R., 29 Stillwater Place, Palmerston North 5301
ZL2VE Hansen, G. H., 9 Sanders Avenue, Napier 4001
ZL2VEW Details unknown
ZL2VFR Percival, Percy, Private Box 2565, Wellington 6020
ZL2VFS Smith, F., 3 Wilson Street, Pahiatua 5470
ZL2VG Price, D. A. (Tony), PO Box 90-901, Auckland Mail Centre, Auckland 1030
ZL2VGB McAnulty, G. B., 35 Daniell Street, Masterton 5901
ZL2VGH Details unknown
ZL2VGL Lane, G. W., PO Box 50-289, Porirua 6215
ZL2VH Upper Hutt Branch NZART (Inc.), see Branch Directory
ZL2VHF Details unknown
ZL2VHT Details unknown
ZL2VI Manning, E. E., 33 Tiverton Crescent, New Plymouth 4601
ZL2VIR Details unknown
ZL2VJ Jones, Vivienne, 10 John Guthrie Place, New Plymouth 4601
ZL2VJB Gosnell, J. B., 10 Eton Place, Palmerston North 5301
ZL2VJL Legg, J. B., 46 Grey Street, Feilding 5600
ZL2VJR Rhodes, J. M., 54 Kempton Street, Greytown 5953
ZL2VJS Sefton, J. (Mrs), 45 Newcastle Street, Palmerston North 5301
ZL2VJW Wallace, J. J., 18 Cobden Road, Napier 4001
ZL2VK Wallace, I. R., 22 Parsons Street, Wanganui 5001
ZL2VKB Details unknown
ZL2VKD Allen, J. G., 95 Manuka Street, Wanganui 5001
ZL2VKE Pomana, S. M., PO Box 80, Pongaroa 5470
ZL2VL Gloag, G. F., 148a West Street, Feilding 5600
ZL2VLA Nixon, P. A., 194 Frankley Road, New Plymouth 4601
ZL2VLB Bennett, Lance, 31 Miro Street, Inglewood 4651
ZL2VM Bull, M. B., 51 Liverpool Crescent, Napier 4001
ZL2VMB McNabb, B. V., 6 Cumbria Lane, Westmorland, Christchurch 8002
ZL2VME Cockroft, D. A., 84 Wyndham Avenue, Pinehaven, Upper Hutt 6007
ZL2VMH Hoult, M. R., 4 Bancroft Terrace, Newlands, Wellington 6004
ZL2VMJ Johns, M. F., 16 Cannon Street, New Plymouth 4601
ZL2VN Gaudin, W. G., 18 Trafalgar Street, New Plymouth 4601
ZL2VNA Details unknown
ZL2VO Hayman, G. C., PO Box 157, Masterton 5901
ZL2VOC Rackstraw, A G, 2 Argyle Grove, Upper Hutt 6007
ZL2VOX Details unknown
ZL2VP Cheshire, A. H., 5 Seddon Street, Upper Hutt 6007
ZL2VPA Arnold, P. M., PO Box 38-360, Wellington Mail Centre 6332
ZL2VPH Harvey, P. N., 129 Cracroft Street, Waitara 4656
ZL2VQ Gaudin, Carol, 18 Trafalgar Street, New Plymouth 4601
ZL2VRC Details unknown
ZL2VRJ Johnson, R. A., 6 Dalrymple Place, Marton 5460
ZL2VRX Details unknown
ZL2VS Miller, Dusty, 41 Alexandra Street, Marton 5460
ZL2VSG Gaudin, S. L., 18 Trafalgar Street, New Plymouth 4601
ZL2VSJ Details unknown
ZL2VSL Lawn, S. A., 36 Roots Street, Feilding 5600
ZL2VSM McAnulty, S. M., 35 Daniell Street, Masterton 5901
ZL2VSP Prakash, S., 23 Tamahine Street, Miramar, Wellington 6003
ZL2VT Arthur, A. J. M. (Mrs), 51 Maraetai Heights Road, Maraetai 1705
ZL2VTH Details unknown
ZL2VV Carter, L. J., 13 Waterview Road, Devonport, Auckland 1309
ZL2VVM Monk, V. B., Kapua Farm, RD 1, Featherston 5952
ZL2VW Gray, O. T., 16 Gonville Avenue, Wanganui 5001
ZL2WA Wellington VHF Group, see Branch Directory
ZL2WAG Ragan, G. S., 32 Mitchell Street, Wanganui 5001
ZL2WAJ Details unknown
ZL2WAL Wallace, R. G., 149 Orangi Kaupapa Road, Northland, Wellington 6005
ZL2WAS Kirk, G. A., 92 Somerset Road, Wanganui 5001
ZL2WAT Details unknown
ZL2WAU Cooper, S. R., Rosewood Villa, 24 York Street, Dannevirke 5491
ZL2WAX Campbell, W. M., c/- P. Penberthy, RD 5, Rangitiki Lane, Palmerston North 5321
ZL2WAZ Watkins, A. L., 46 Strand Crescent, Lower Hutt 6009
ZL2WB Wellington Amateur Radio Club (Inc.), see Branch Directory
ZL2WBA Angland, B. J., 24 Pitama Road, Palmerston North 5301
ZL2WBG Galley, B. H., 1 Karamea Crescent, Palmerston North 5301
ZL2WBH Hey, B. F., 1a Cooke Place, Taradale, Napier 4001
ZL2WBK Details unknown
ZL2WBS Details unknown
ZL2WBW Watt, B. J., 21 South Belt, Masterton 5901
ZL2WCG Gubbins, C. P., 3 Sackville Street, Grey Lynn, Auckland 1002
ZL2WCL Lee, C., 3 Forsyth Street, Napier 4001
ZL2WCT Details unknown
ZL2WDC Callander, D. J., 23 Longcroft Terrace, Wellington 6004
ZL2WDI Details unknown
ZL2WDY Details unknown
ZL2WE Stead, June, 502a Charles Street, Hastings 4201
ZL2WEM Details unknown
ZL2WF Wensley, N. L., 29 Cawthron Crescent, Nelson 7001
ZL2WH McAuley, A. W., 151 Townsend Road, Miramar, Wellington 6003
ZL2WI Wilkinson, J. G., 70 Queens Road, Waikanae Beach 6010
ZL2WIP Perrett, I. G., 9 Totara Crescent, Hawera 4800
ZL2WIT Johnston, M. D., Address unknown
ZL2WIZ Details unknown
ZL2WJ Ross, J. B., 16 Moncrieff Avenue, Tahunanui, Nelson 7001
ZL2WJM Mulholland, M. J., 251 Princes Street, Hawera 4800
ZL2WJO Details unknown
ZL2WJP Palmer, J. M., Paraparaumu 6010
ZL2WJT Taylor, J. G., 4a Conway Road, Eltham 4657
ZL2WJW Watt, J. J., 19 Chamberlain Road, Masterton 5901
ZL2WKM Mulholland, K. J., 22b High Street, Eltham 4657
ZL2WLI Details unknown
ZL2WME Details unknown
ZL2WMJ Jackson, M. M., 6 Cambridge Terrace, Masterton 5901
ZL2WMM Mulholland, M. J., 22b High Street, Eltham 4657
ZL2WN Guppy, R. P., 6 Mascot Street, Tawa, Wellington 6006
ZL2WNB Barry, N. W., 20 Gladstone Street, Hawera 4800
ZL2WOG Harris, P. F., 19 Campbell Street, Feilding 5600
ZL2WON Kirkland, J. C., 36a Haydon Street, Palmerston North 5301
ZL2WOW Herbert, A. R., 860 Mataro Road, RD 45, Urenui 4655
ZL2WP Douglas, W. L. B., 20 Stanhope Grove, Korokoro, Lower Hutt 6008
ZL2WPC Details unknown
ZL2WPR Ryan, P. H., 8a Keith Street, Wanganui 5001
ZL2WPS Shanaham, Peter, 50 Homewood Crescent, Karori, Wellington 6005
ZL2WR Whitehead, E. S., Unit 12, Taradale Masonic Village, 15 Devonshire Place, Taradale, Napier 4001
ZL2WRM Millar, L. R., 18 Armagh Terrace, Marton 5460
ZL2WRW Whenmouth, R., 118 Bealey Avenue, Christchurch 8001
ZL2WS Scott, W. G., PO Box 859, Napier 4015
ZL2WSB Bruce, S. K., RD 14, Ashhurst 5451
ZL2WSP Details unknown
ZL2WSS Wallace, S. A., 25a Smith Street, Dannevirke 5491
ZL2WSY Kemp, A. B., 344 South Road, Hawera 4800
ZL2WW Hyndman, J. E., 7 Wadsworth Crescent, Blenheim 7301
ZL2WWT Triggs, D., 37 Rennie Anenue, Palmerston North 5301
ZL2WZ Wade, F., 26 Isabel Grove, Wainuiomata 6008
ZL2WZZ Saelmans, J. J., 172a Pembroke Street, New Plymouth 4601
ZL2XA Radio for the Print Disabled Inc., PO Box 360, Levin 5500
ZL2YET Arnold, W. M., (Station located in Seatoun, Wellington), PO Box 30-344, Lower Hutt 6315
ZL2YKY Cliff, M. A., 102 Smithfield Road, Wanganui 5001
ZL2YZM Fenton, D. J., 27 Blake Street, Waitara 4656
ZL2ZLW Hill, I. McK. G., 29 Holdsworth Avenue, Upper Hutt 6007
ZL2ZZZ Yamaya, K., C/O 22 Pethy Bridge Street, Motueka 7161

ZL3 CALL-SIGNS

ZL3AAA Garlick, R. A., 18 Harbour Road, Motueka 7161
ZL3AAB Garlick, Zelda, 18 Harbour Road, Motueka 7161
ZL3AAC Atkinson, H. R., 98 Condell Avenue, Papanui, Christchurch 8005
ZL3AAD Alderson, G. E., 7 Priors Road, R.D 1, Rangiora 8254
ZL3AAG Batterbury, C., 46 Glenmore Avenue, Casebrook, Christchurch 8005
ZL3AAH O'Brien, W. M., 255 Estuary Road, Christchurch 8007
ZL3AAL Vincent, R. K., 1 Hall Street, Kaiapoi 8252
ZL3AAN Colville, L. M., 115 Cameron Street, Ashburton 8300
ZL3AAO Ballantyne, S. T., 16 Dellow Place, Spreydon, Christchurch 8002
ZL3AAS Silke, A. J., 61a Cheyenne Street, Upper Riccarton, Christchurch 8004
ZL3AAT van Waelsden, F. H. A. M., 138 Rolleston Street, Rakaia 8355
ZL3AAU Miller, J. G., Whitewood Crescent, R.D 5, Christchurch 8021
ZL3AAY Bowie, A. F. S., 4 Westburn Terrace, Burnside, Christchurch 8005
ZL3AAZ Allan, Lorna, 74 Good Street, Rangiora 8254
ZL3AB Sullivan, M. T. D., 10 Farnley Place, Parklands, Christchurch 8009
ZL3ABA Allan, S. L., 74 Good Street, Rangiora 8254
ZL3ABB McKay, D. J., 55 Wingate Street, Christchurch 8005
ZL3ABC Hooker, R. O., 272 Wainoni Road, Christchurch 8007
ZL3ABD Hancock, C. W. I., 17 Mafeking Street, Christchurch 8007
ZL3ABH Middlemiss, I. R., 427 Linwood Avenue, Christchurch 8006
ZL3ABJ Jensen, B. D., 21 Colwyn Street, Papanui, Christchurch 8005
ZL3ABL Brookes, I. A., 34 Allnatt Street, Temuka 8752
ZL3ABN Lawry, D. W., 90 Awatea Road, Halswell, Christchurch 8003
ZL3ABO Glass, B. L., 22 Hertford Street, Arrowtown 9196
ZL3ABP Snushall, J. G., PO Box 108, Kaikoura 8280
ZL3ABR Harris, G. T., 283 Cannon Hill Crescent, St Andrews Hill, Christchurch 8008
ZL3ABU Strachan, I. S., 22 Rowses Road, Christchurch 8007
ZL3ABW Maunder, H. B., 23 Buchanans Road, Riccarton Park, Christchurch 8004
ZL3ABY O'Sullivan, K. D., 53 Marlborough Street, Greymouth 7801
ZL3AC Christchurch Branch NZART (Inc.), see Branch Directory
ZL3ACA Nuth, G. L. (Miss), 47 Marlow Road, Aranui, Christchurch 8007
ZL3ACB Mollison, G. W. P., 11 Goya Place, Christchurch 8005
ZL3ACC Chambers, C. H., 21b De Ville Place, Christchurch 8006
ZL3ACD Batchelor, G. W., 41 Kirkwood Avenue, Christchurch 8004
ZL3ACE Dodgshun, J. C., 10 Devonport Lane, Christchurch 8001
ZL3ACF Richardson, J. T., 3 Monowai Crescent, Christchurch 8009
ZL3ACH White, D. J., 1 Pitman Place, Waimate 8791
ZL3ACL Bidlake, R. P., 24 James Street, Timaru 8601
ZL3ACM Zampese, M. J. (Mrs), 26 Olwyn Terrace, Frankton, Hamilton 2001
ZL3ACN Honey, R. M., 167 Brittan Street, Hokitika 7900
ZL3ACS Borgfeldt, C. D., 37 Blankney Street, Hornby, Christchurch 8004
ZL3ACT Patten, G. J., 3 Veitches Road, Casebrook, Christchurch 8005
ZL3ACU McKay, B., 23 Palmside Street, Hoon Hay, Christchurch 8002
ZL3ACX Robbins, K. F., 4 Kuaka Crescent, Bromley, Christchurch 8006
ZL3ADA Bell, R. W., 32 Flower Street, Christchurch 8005
ZL3ADB Crase, G. E., 59 Wakefield Street, Westport 7601
ZL3ADC Lintott, N., 49 Jocelyn Street, Redwood, Christchurch 8005
ZL3ADF Hirtzel, J. E., 451 Greers Road, Christchurch 8005
ZL3ADG Burnside High School Radio Club, (Trustee ZL3TQH), Greers Road, Christchurch 8005
ZL3ADH Boote, R. J., 8 Hinton Road, Karoro, Greymouth 7801
ZL3ADJ Jennings, L. W., 23 Kirk Street, Kaiapoi 8252
ZL3ADL Wise, R. A., F29 Harmon Courts, 85 Poulson Street, Christchurch 8002
ZL3ADN Dykes, G., 3 Fraser Place, Rangiora 8254
ZL3ADO Dolamore, Carleen, 59a Dunbarton Street, Redwood, Christchurch 8005
ZL3ADP MacDonald, D. C., 221 Middle Road, Ashburton 8300
ZL3ADQ Hamilton, J. C., 12 Highcrest Heights, Christchurch 8002
ZL3ADS Squire, D. D., 15 Alexandra Street, Temuka 8752
ZL3ADT Johnson, R. D., 1021 Tram Road, Mandeville, RD 2, Kaiapoi 8252
ZL3ADV Phillips, R. W., 31 Appleby Crescent, Christchurch 8005
ZL3ADZ Wignall, T. J. S., 7 Lakeview Place, Halswell, Christchurch 8003
ZL3AE May, Sharron, 156 Pages Road, Timaru 8601
ZL3AF Ashburton Branch NZART (Inc.), see Branch Directory
ZL3AFB Stirling, K. W., 37 Kelvin Crescent, Ashburton 8300
ZL3AFC Simpson, P. R., 168c Monks Spur Road, Redcliffs, Christchurch 8008
ZL3AFD Haberecht, D. C., 272 Wainoni Road, Christchurch 8007
ZL3AFE Zampese, L., 105 Ellicott Road, Hamilton 2001
ZL3AFH Latham, W. I., 168 Mackenzie Avenue, Opawa, Christchurch 8002
ZL3AFN Griffiths, J. P., PO Box 11-262, Sockburn Mail Center, Christchurch 8030
ZL3AFQ Duxbury, I. N., Stephen's Bay Road, Stephen's Bay, RD 2, Motueka 7160
ZL3AFS Pearcy, E. A., 239 Condell Avenue, Papanui, Christchurch 8005
ZL3AFV Henden, J. R., 221 Innes Road, St Albans, Christchurch 8005
ZL3AFW Wilson, W. E., Sandy Knolls Road, RD 1, Christchurch 8021
ZL3AG Gibson, E. N., 36 Grahams Road, Ilam, Christchurch 8004
ZL3AGA Bolland, N., 12 Brent Place, Christchurch 8005
ZL3AGB Barrett, T., 47 Arnold Street, Sumner, Christchurch 8008
ZL3AGF Blanchard, J. S., 37 Reynolds Avenue, Bishopdale, Christchurch 8005
ZL3AGL Sinclair, S., 54 Withells Road, Avonhead, Christchurch 8004
ZL3AGM Jackson, B. A., 22 Guadeloupe Crescent, Granada Village, Wellington 6004
ZL3AGP Thomson, G. G., 10 Hanrahan Street, Christchurch 8004
ZL3AGQ Harris, D. W., 67 Ayers Street, Rangiora 8254
ZL3AGS Lovell, J. D., 41 Yardley Street, Avonhead, Christchurch 8004
ZL3AGT Foster, I. M., Cronadun, RD 1, Reefton 8290
ZL3AGY Moyle, J. R., 68c Clyde Road, Christchurch 8004
ZL3AH Hernandez, A., c/- ZL4HU, PO Box 7, Clyde, Central Otago 9180
ZL3AHL Lyon, K. W., 2 Leander Street, Papanui, Christchurch 8005
ZL3AHM Dineen, R. T., 106 Halswell Junction Road, Halswell, Christchurch 8003
ZL3AHN Whitley, W. G., 13 Heyders Road, Christchurch 8009
ZL3AHO Reed, B. S., 105 Spinnaker Drive, Whitby, Porirua 6006
ZL3AHP Payne, A. T., 9 Factory Road, Belfast, Christchurch 8005
ZL3AHQ McDonald, A. W., 73a Cranford Street, St Albans, Christchurch 8001
ZL3AHS Symes, Barbara, 783 Downs Road, RD 1, Rangiora 8254
ZL3AHT Holland, Sue, 15 Zephyr Terrace, Governors Bay, Lyttelton 8033
ZL3AHU Holland, M. C., 15 Zephyr Terrace, Governors Bay, Lyttelton 8033
ZL3AHV Papanui High School Radio Club, (Trustee: ZL3AHP), Langdons Road, Christchurch 8005
ZL3AHW Williams, N. D., PO Box 172, Christchurch Mail Centre 8015
ZL3AHX Wells, P. H., 27 Samuel Street, Hoon Hay, Christchurch 8002
ZL3AHY Lovell, Mary, 41 Yardley Street, Avonhead, Christchurch 8004
ZL3AI Fraser, D. J., PO Box 12, Waipara 8270
ZL3AIB Timms, R. C., 7 Derenzy Place, Christchurch 8004
ZL3AIC Chilton, M. T., 183 Belfast Road, Belfast, Christchurch 8005
ZL3AID Hawksley, K. A., 4 Winchfield Street, Christchurch 8007
ZL3AIK Taylor, D. A., 78 Wingatui Road, Mosgiel 9007
ZL3AIV Rowlands, R. J., 6 Centennial Avenue, Christchurch 8004
ZL3AIX Tillman, E. S., 19b Mulberry Place, Christchurch 8005
ZL3AJ McDonald, K. R., 44 Inwoods Road, Christchurch 8009
ZL3AJA Keeley, L. J., 23 Wills Street, Ashburton 8300
ZL3AJC Strachan, J. H., 41 New Brighton Road, Christchurch 8006
ZL3AJE Robbins, D. J., 66 Acacia Avenue, Christchurch 8004
ZL3AJK Jenkins, R. M., 486 Marine Parade, South New Brighton, Christchurch 8007
ZL3AJW Wilds, J. R., 32 Bay View Road, Cass Bay, Lyttelton 8012
ZL3AK Rowe, D. J., 10 Marama Crescent, St Andrews Hill, Christchurch 8008
ZL3AL Smythe, G. C., 147 Highsted Road, Bishopdale, Christchurch 8005
ZL3AM Kirk, R. E., 43 Dover Street, Christchurch 8001
ZL3AN McLean, J. L., PO Box 6, Westport 7615
ZL3AO Bell, M. W., 203 Weston Road, Christchurch 8005
ZL3AP Whitfield, S. J. N., 48 Hawthornden Road, Avonhead, Christchurch 8004
ZL3APP Parkyn, P. R., 4 Witham Street, Hornby, Christchurch 8004
ZL3AQ Mattingley, G. T., 89 Creek Road, Ashburton 8300
ZL3AR Hunter, A. M., Cochranes Road, R.D 7, Ashburton 8300
ZL3ARJ Adams, R. J., 30 Wesley Street, Kaiapoi 8252
ZL3ARM Maher, R. H., 172e Rocking Horse Road, Christchurch 8007
ZL3AS Murray, Andrew
ZL3ATK Details unknown
ZL3ATV O'Brien, C. M., 104 Estuary Road, Christchurch 8007
ZL3AV Blyth, D. H., 36a Chipping Lane, Redwood, Christchurch 8005
ZL3AW Phillips, M. A. (Dr), Institute of Space and Atmospheric Studies, University of Saskatchewan, 116 Science Place, Saskatoon, SK, Canada, S7N-5E2
ZL3AZ Rayner, D. A., 23 Waitohi Street, Hornby, Christchurch 8004
ZL3BAB Ackroyd, B. E. I. (Mrs), Ackroyd Road, Waitohi, RD 25, Temuka 8752
ZL3BB Gray, G. W., 31 Denniston Crescent, Redwood, Christchurch 8005
ZL3BCR Rowe, B. C. T., 8 Taumutu Street, Southbridge 8150

ZL3BE Christchurch Boys' High School Radio Club, (Trustee: ZL3TX), PO Box 8157, Riccarton, Christchurch 8034
ZL3BG Himing, L. C., 23 Coopers Road, Shirley, Christchurch 8006
ZL3BH Bowman, G. R. B., 158 Revell Street, Hokitika 7900
ZL3BI Brice, K. L., 18 College Avenue, Christchurch 8005
ZL3BK Halliburton, G. A., 41a Augusta Steet, Christchurch 8008
ZL3BM Means, C. B., 1318 Blythe Road, RD 3, Cheviot 8271
ZL3BN Sim, G. W., 6a Oakhurst Place, Russley, Christchurch 8004
ZL3BP Mountford, T. G., 2/207a Otipua Road, Timaru 8601
ZL3BPA Dawson, S. F., 148b Hawthornden Road, Avonhead, Christchurch 8004
ZL3BQ Urlwin, Anne, PO Box 17-512, Sumner, Christchurch 8030
ZL3BR White, M. G., 36 Margaret Street, Stratford 4700
ZL3BRB Details unknown
ZL3BRC Details unknown
ZL3BS Tweedie, S. B., 167 Wales Street, Oaklands, Christchurch 8003
ZL3BSH Richards, P. D., 7 Mortimer Street, Waimate 8791
ZL3BT White, E. I., 95 Abberley Crescent, St Albans, Christchurch 8001
ZL3BV Schaef, L. M., 10 Bridge Street, Greymouth 7801
ZL3BW Details unknown
ZL3BX Pattrick, B. L., 1 Kanuku Place, Cashmere, Christchurch 8002
ZL3BY Halford, B. B., 37 McHardie Street, Wallaceville, Upper Hutt 6007
ZL3BZ Johnson, C., 7 Hillview Place, Pleasant Point 8772
ZL3CA Sandford, T. W., Address unknown
ZL3CAN Howell, H. G. M., 12a Salford Avenue, Christchurch 8005
ZL3CAR Canterbury Amateur Radio Development Society Inc., PO Box 21-188, Edgeware, Christchurch 8030
ZL3CC Crosby, K. G., 175 Trevors Road, Ashburton 8300
ZL3CE Hewson, J. N., 8 Dunns Avenue, Pines Beach, Kaiapoi 8252
ZL3CG Silverwood, K., 12 Banbury Street, Waimangaroa 7650
ZL3CH Cook, H. P., 5/16 Wanaka Place, Mairehau, Christchurch 8005
ZL3CHC Details unknown
ZL3CJ Parker, T. L., 148b Panorama Road, Sumner, Christchurch 8008
ZL3CK Seay, M. R., Dept of Anaesthesia, Middlemore Hospital, Private Bag, Otahuhu 1133
ZL3CKI McGlinn, A. J., c/- Graeme McGlinn, PO Box 2099, Christchurch 8015
ZL3CM Burrell, K. M., 5 Jacaranda Grove, Maungaraki, Lower Hutt 6009
ZL3CN Mantell, G. N., 39 Cook Drive, Whitianga 2856
ZL3CO Wylie, P. B., 101 Englefield Road, Belfast, Christchurch 8005
ZL3COL Rowe, C. G., 20 Kingsbury Avenue, Rangiora 8254
ZL3CP Details unknown
ZL3CR Smith, W. E., 9 Wolsey Place, Hillmorton, Christchurch 8002
ZL3CRM McTurk, C. R., PO Box 102, Amberley 8251
ZL3CS Downer, G. H., 29a Grange Street, Opawa, Christchurch 8002
ZL3CSB Details unknown
ZL3CT Bennett, R. S., 67 Aronui Road, Alexandra 9181
ZL3CTN Scott, M. J., 397b Durham Street, Christchurch 8001
ZL3CU Moffatt, S. Z., 17 Wayside Avenue, Christchurch 8005
ZL3CV Chapman, A. R. B., 2/70 Proctor Street, Papanui, Christchurch 8005
ZL3CW Calvo, J., PO Box 593, Pukekohe 1800
ZL3CX Emerson, T. C., 67 Epsom Avenue, Epsom, Auckland 1003
ZL3DA Johnson, D. A., 56 Thorp Street, Motueka 7161
ZL3DAC Croker, K. J., c/- Waimangaroa Post, via Westport 7650
ZL3DAT Cullen, L., 46 Wilton Crescent, Christchurch 8005
ZL3DB Buschl, B. D., c/- Sorenson, 62 Shortland Street, Christchurch 8006
ZL3DC Grindrod, R. J., 5 Macrocarpa Place, Ranui, Auckland 1008
ZL3DD Mitchell, A. R., 55 Shoreham Street, Blockhouse Bay, Auckland 1007
ZL3DES Thomas, D. J., 90 Allens Road, Ashburton 8300
ZL3DF Ellis, M. R., 41 Welsford Street, Woodend 8255
ZL3DG Hood, N. D., 47a Aorangi Road, Christchurch 8005
ZL3DGW Ward, D. G., (VK4DGW), PO Box 209, Bracken Ridge, Queensland 4017, Australia
ZL3DH Hardie, W. S., 245a Harewood Road, Christchurch 8005
ZL3DI Tylee-Porter, G. J., 62 Broad Street, Southbridge 8150
ZL3DJ Gill, M. E., River Road, Greenpark, R.D 2, Christchurch 8021
ZL3DL Barker, L. G., 37 Burwood Road, Burwood, Christchurch 8009
ZL3DM McGuire, Dave, 14 Snell Crescent, Waihi Beach, Waihi 2980
ZL3DO O'Malley, D. B., 72 Crofton Road, Christchurch 8005
ZL3DP Meikle, B., 24 Abraham Heights, Nelson 7001
ZL3DR Godfrey, R. J., Main South Road, R.D 2, Kaikoura 8280
ZL3DS Brewster, D. W., Address unknown
ZL3DT Searle, G. G., Lake Mahinapua, Hokitika 7900
ZL3DV Jefferis, E. W., 4 Cunningham Street, Leeston 8151
ZL3DWW Watts, D. W., 8 Holmes Street, Waimate 8791
ZL3DX McGee, W. H., 116b Highsted Road, Harewood, Christchurch 8005
ZL3DXC Canterbury DX Association, Trustee: ZL3NZ, Waikuku Beach 8254
ZL3DY Firman, R. K., F2 - 16 Norwood Street, Timaru 8601
ZL3DZ Thomson, G., 2 Naylor Street, Waimate 8791
ZL3FB Schroeder, W. F. (Rev), The Vicarage, 8 Roxburgh Street, Christchurch 8002
ZL3FG O'Neill, J. J., 26 McBratneys Road, Christchurch 8006
ZL3FJ Brown, D. A., 62 Hudson Street, Christchurch 8005
ZL3FK Hepburn, L. D., 22 Gwynfa Avenue, Cashmere, Christchurch 8002
ZL3FM Campbell, R. J., 3 Shamrock Place, Oaklands, Christchurch 8003
ZL3FMS Simpson, F. M., 1007 Main South Road, Greymouth 7801
ZL3FN Wilson, R. J., 11 High Street, Greymouth 7801
ZL3FO Blackmore, J. H., 364 Riverlaw Terrace, St Martins, Christchurch 8002
ZL3FOX Fox, A. R. E., 88 Westholme Street, Bryndwr, Christchurch 8005
ZL3FP Kyle, E. A. J., c/- PJ Rogers, 413 Cashmere Road, Christchurch 8002
ZL3FR Nixon, M. A., Address unknown
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ZL3FT Clapham, T. S., Address unknown
ZL3FU McPhail, T. K., 7 Ostend Place, Christchurch 8004
ZL3FW O'Brien, J. R., 68a Windermere Road, Papanui, Christchurch 8005
ZL3FX McSherry, O. E., 50 Napier Road, Havelock North 4201
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ZL3GB Bryant, H. G. H., 44 Ward Street, Kaikoura 8280
ZL3GC Baker, D. M., PO Box 234, Ashburton 8300
ZL3GE Welford, A. R., 12 Devon Street, Timaru 8601
ZL3GF Bool, W. A., 145 South Bay Parade, South Bay, Kaikoura 8280
ZL3GK Richardson, T. C. W., 12 Hammond Place, Spreydon, Christchurch 8002
ZL3GL May, Glenn, 156 Pages Road, Timaru 8601
ZL3GM Pimm, O. W., 59a Dunbarton Street, Redwood, Christchurch 8005
ZL3GN Details unknown
ZL3GO Scott, T. R., 12 Osborn Grove, Ashburton 8300
ZL3GR Rowe, N. L., PO Box 4013, Mount Maunganui South 3030
ZL3GS Wright, G. M., 25 Dunedin Street, Redwood, Christchurch 8005
ZL3GT Somerville, J. H., 14 Park Lane, Timaru 8601
ZL3GU Hughes, J. R., 128 Preston Road, Blaketown, Greymouth 7801
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ZL3GX Chapman, Alan, 7 Dellow Place, Spreydon, Christchurch 8002
ZL3GY Details unknown
ZL3GZ Smith, H. E., 15 Ferry Road, Spring Creek, Blenheim 7350
ZL3HAG Hag, P., c/- D. McMahon, 15 Harling Avenue, Hilmorton, Christchurch 8002
ZL3HAM Buckland, T, 3100 Tram Road, Bennetts, RD, Oxford 8253
ZL3HC Brittenden, C. E. R., 329 Wainoni Road, Christchurch 8007
ZL3HD Chambers, D. H., 5 Stiles Place, Dallington, Christchurch 8006
ZL3HF McDonald, B. M., 43 Rimu Street, Timaru 8601
ZL3HG Davy, K. T., 65 Stafford Street, Hokitika 7900
ZL3HGB Bouwknegt, H. G., 35 Elizabeth Street, c/- PDC, Cave 8770
ZL3HH Wylie, R. L., 21 Vickery Street, Kaiapoi 8252
ZL3HM Evans, C. E., 123 Beach Road, Kaikoura 8280
ZL3HN Holtum, J. W., 461 Johns Road, Harewood, Christchurch 8005
ZL3HO Lowry, R. C., 2/1122 Avonside Drive, Avondale, Christchurch 8007
ZL3HP Hoving, P., 24 Royal Park Drive, Parklands, Christchurch 8009
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ZL3HU Sandford, B. D., 19a Mons Avenue, Mt Roskill, Auckland 1004
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ZL3HX Marshall, D. A., PO Box 57, Woodend 8255
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ZL3IA Tyerman, P. F., 9 Elstow Place, Spreydon, Christchurch 8002
ZL3IB Walker, J. R. L., 19 Athol Terrace, Christchurch 8004
ZL3IC McCulloch, E. N., 259 Williams Street, Kaiapoi 8252
ZL3IDA Andrews, I. D., PO Box 8393, Riccarton, Christchurch 8034
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ZL3IG Ross, P. J., 4 Oakfield Street, Christchurch 8005
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ZL3IJ Inglis, J. M., 288 Estuary Road, Christchurch 8007
ZL3IM Sullivan, J. T., 34 Rollesby Street, Christchurch 8002
ZL3IS Oka, N., c/- Bell, 203 Weston Road, Christchurch 8005
ZL3IT MacDonald, J. D., No 2 RD, Ranfurly, Central Otago 9071
ZL3IU Gray, N. C., Franks Road, RD 6, Ashburton 8300
ZL3IZ Duncan, A., 28a Bowen Street, Upper Riccarton, Christchurch 8004
ZL3JAW Weddell, J., 43 Feldwick Drive, Kaiapoi 8252
ZL3JB Burke, J. P., 246 Main North Road, Redwood, Christchurch 8005
ZL3JD van Kuilenburg, Phil, 45 Farrelly Avenue, Owariraka, Auckland 1004
ZL3JE Stewart, D. A., 33 King Street, Pareora 8790
ZL3JF Henderson, H. P., 35 Hillview Crescent, Timaru 8601
ZL3JG Rawstorn, G. J., 15 Tai Paku Paku Road, Seatoun Heights, Wellington 6003
ZL3JI Foulds, L. F., 45 Jervois Street, Christchurch 8007
ZL3JJ Crump, M. W., 66 Hewitts Road, Woodend 8255
ZL3JKL Details unknown
ZL3JL McFarlane, A. R., 88 Chalmers Avenue, Ashburton 8300
ZL3JM Bennett, P. W., 85 Leinster Avenue, Raumati South, Wellington 6010
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ZL3JO Johnstone, G V O, F/2 28 New Brighton Road, Christchurch 8006
ZL3JQ Poll, A. K., 155 Halswell Road, Christchurch 8002
ZL3JR Kelly, S. J. C., 34 Liverton Crescent, Christchurch 8005
ZL3JS Smith, K. R., 231 Church Street, Timaru 8601
ZL3JT McMahon, D. D., 15 Harling Avenue, Hillmorton, Christchurch 8002
ZL3JU Sorensen, A. G., 62 Shortland Street, Wainoni, Christchurch 8007
ZL3JV MacGeorge, B. A., 9 Opie Street, Waimate 8791
ZL3JW Johnston, Lance, 2 Waitaki Street, New Brighton, Christchurch 8007
ZL3JX Jones, Owen L., "Holme" Station, 2 RD, Timaru 8621
ZL3JY Stalker, J. P., Greenpark, No 4 RD, Christchurch 8021
ZL3JZ Dumbleton, R. S., 74 Kaiwara Street, Christchurch 8002
ZL3KA Macer, J., 31 Colwyn Street, Papanui, Christchurch 8005
ZL3KB Barnsdale, K. P., 50 Cardrona Street, Christchurch 8007
ZL3KD Harding, A. G. F., 6 Bowline Place, Whitby, Porirua 6006
ZL3KE McGrath, R. E., 42 Lyndhurst Crescent, Christchurch 8007
ZL3KEL Details unknown
ZL3KG Gibbins, Kevin C., 41 Dunn Street, Christchurch 8002
ZL3KH Heyworth, K. C., 327 River Road, Richmond, Christchurch 8001
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ZL3KIM Webb, K. R., 26 Harling Avenue, Christchurch 8002
ZL3KJ Banfield, John, 3 Fenhall Street, Christchurch 8004
ZL3KK Goodare, T. T., 1 Totara Drive, Oxford 8253
ZL3KL Howell, B. C., 6 Deepdale Street, Christchurch 8005
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ZL3KR Hughes, A. G., 4 Exton Street, Redwood, Christchurch 8005
ZL3KS Downer, M. H., 34 Torquay Place, Christchurch 8005
ZL3KU Waters, K. A., 33 Cook Street, Timaru 8601
ZL3KV Brown, H. H., 77 The Avenue, Sunnybank Hills, Brisbane, QLD 4109, Australia
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ZL3KWH Heyward, K. W., 46 Yellowstone Crescent, Christchurch 8009
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ZL3LB Hamilton, W. R., 9b Amstel Lane, Shirley, Christchurch 8001
ZL3LE Guard, B. N., S.H 69, Cronadun, R.D 1, Reefton 8290
ZL3LI Neal, J. V. (Rev), 118 Budge Street, Blenheim 7301
ZL3LIZ Buckland, L., 3100 Tram Road, Bennetts, RD, Oxford 8253
ZL3LJ Jordan, Les (L. P. W.), c/- S. Smith, Pigeon Flat, Waitati, RD 2, Dunedin 9021
ZL3LJC Osborne, R. R. W., C/- Camp David R.D 3, Waipara 8270
ZL3LM Burrell, N. W., 209 Ilam Road, Christchurch 8004
ZL3LO Cairns, A., 42 Santa Maria Avenue, Mt Pleasant, Christchurch 8008
ZL3LP Brown, H. P., 8 Neill Street, Hornby, Christchurch 8004
ZL3LQ Paltridge, K. K., 131 Warrington Street, Christchurch 8001
ZL3LS Miller, G. C., 30 Nirvana Street, Brooklands, Christchurch 8009
ZL3LSP Details unknown
ZL3LU Campbell, G. R., 24 Rosamund Place, Halswell, Christchurch 8003
ZL3LVS Van Schooten, L. A. A., 195b Wairakei Road, Christchurch 8005
ZL3LX Kirkpatrick, I. J., 99 Bickerton Street, Christchurch 8007
ZL3LZ Dale, A. J. E., 7 Bradshaw Terrace, Riccarton, Christchurch 8001
ZL3MA Kingswell, G. N., 333 King Street, Temuka 8752
ZL3MB Details unknown
ZL3MC McKenzie, D. S., 47 Kotare Street, Fendalton, Christchurch 8004
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ZL3MHB Details unknown
ZL3MHF Details unknown
ZL3MI Sullivan, R. E., 103a Jeffreys Road, Bryndwr, Christchurch 8005
ZL3MJ Lewis, C. T., 30 Te Rama Place, Wainoni, Christchurch 8007
ZL3MJS Stubberfield, Mike, 138 Rutland Street, St Albans, Christchurch 8005
ZL3MK May, K., 30 Nikau Place, Timaru 8601
ZL3ML McNicol, A. D., 26 Gainford Street, Christchurch 8004
ZL3MM Hills, R. I., 25 Rapaki Road, Christchurch 8002
ZL3MO Cole, W. R., Grange Settlement Road, Temuka 8752
ZL3MP Details unknown
ZL3MQ McMaster, R. J., 23 Greens Road, RD 1, Kaiapoi 8252
ZL3MS Brash, J. P., 5b Indira Lane, Cashmere, Christchurch 8002
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ZL3MUF Christchurch VHF DX Group, Trustee: RD Johnson, 1021 Tram Road, Mandeville, RD 2, Kaiapoi 8252
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ZL3MZ Garlick, P. R., 3 Everett Street, Motueka 7161
ZL3NA Robinson, D. G., Kowhitirangi, R.D 1, Hokitika 7900
ZL3NAH Gorton, D. M., F1/36 Stourbridge Street, Christchurch 8002
ZL3NAI Batey, Stephanie, 408 Barrington Street, Spreydon, Christchurch 8002
ZL3NB Carney, Bill, 174 Beach Road, Christchurch 8009
ZL3NE Gyde, R. M., 26 Anita Avenue, Mt Roskill, Auckland 1004
ZL3NG McVicar, J. J., 17 Winchester Street, Merivale, Christchurch 8001
ZL3NH Rogers, P. J., Corner Cashmere and Happy Home Roads, Christchurch 8002
ZL3NI Walker, D. N., 19 Kathleen Crescent, Hornby, Christchurch 8004
ZL3NJ Kerr, N. J. (Mrs), 359 F2 Mairehau Road, Burwood, Christchurch 8009
ZL3NJA Allan, J. J., Egans Road, R.D 1, Rangiora 8254
ZL3NL Tait, A. Mc M., 8 Ashbourne Street, Burnside, Christchurch 8005
ZL3NO Johannis, K. L., Unit 1, Bainswood, 191 King Street, Rangiora 8254
ZL3NQ Drever, G. R., 36c Burnett Street, Ashburton 8300
ZL3NRA Hunt, Ray, "Cantara", Scargill Valley, RD 3, Amberley 8251
ZL3NS Ositis, T., 128 Brookside Terrace, Christchurch 8005
ZL3NT Blackwell, G. C., 5/82 Lincoln Road, Spreydon, Christchurch 8002
ZL3NU Collett, L. M., 69 Cannon Hill Crescent, Mount Pleasant, Christchurch 8008
ZL3NW Mackintosh, R. M., 144 Main North Road, RD 1, Kaiapoi 8252
ZL3NX Edgar, M. M., 16 St Clio Street, Ilam, Christchurch 8004
ZL3NZ Dacombe, G., 22 Allin Drive, Waikuku, North Canterbury 8254
ZL3OAK Details unknown
ZL3OD Barnes, G. J., 37 Carlton Mill Road, Merivale, Christchurch 8001
ZL3OE Richards, D. L., 38 Frankleigh Street, Christchurch 8002
ZL3OF Milne, I. F., 401a Barrington Street, Spreydon, Christchurch 8002
ZL3OI Godfrey, K. E., The Oaks Rest Home, 88 Main South Road, Christchurch 8004
ZL3OJ Digby, N. M., 4 Norfolk Street, Christchurch 8005
ZL3OR Fallen, J. A., 116 Warren Crescent, Hillmorton, Christchurch 8002
ZL3OT Bromley, R. N., 19 Denham Terrace, Waikari 8276
ZL3OU Bellamore, A. H., 87 Radley Street, Christchurch 8002
ZL3OX Mitchell, C. J., 320 Mt Pleasant Road, Christchurch 8008
ZL3OZ Burberry, R. L., Address unknown
ZL3PAH Holliday, P. A., 275 River Road, Richmond, Christchurch 8001
ZL3PB Lobb, G. W., 7 Ethne Street, St Albans, Christchurch 8001
ZL3PC Haines, P. C., 21 Macaulay Street, Timaru 8601
ZL3PD Pluck, R. L., 2/257 Cameron Street, Ashburton 8300
ZL3PF Asher, A. S., 9 Pompeys Place, Akaroa 8161
ZL3PG Dickson, D. W., 210 Cannon Hill Crescent, Christchurch 8008
ZL3PH Rowe, B., 250 Grahams Road, Burnside, Christchurch 8005
ZL3PI Bartrum, B. R., 31b Bowenvale Avenue, Cashmere, Christchurch 8002
ZL3PK Allan, J. L., 74 Good Street, Rangiora 8254
ZL3PL Lee, C. P., c/- St Clives, 62-70 Aldwins Road, Christchurch 8006
ZL3PM McGee, P. D., 1 Craigieburn Street, Darfield 8172
ZL3PN Boorer, G. F., 48a Newton Street, Timaru 8601
ZL3PO Turner, D. K., Selmers Road, R.D 3, Blenheim 7321

ZL3PP Crichton, R. J., 98 Estuary Road, South New Brighton, Christchurch 8007
ZL3PR Petersen, C. M., 51 Derby Street, Westport 7601
ZL3PS Streeter, P. J., 14 Maltby Avenue, Timaru 8601
ZL3PTB Bower, P. T., 15 Harper Street, Timaru 8601
ZL3PTP Collins, P. T. P., 489 Avonhead Road, Avonhead, Christchurch 8004
ZL3PWS Spinetto, P. W., 8 Melissa Place, Burnside, Christchurch 8004
ZL3PX Chapman, G. A., 8 Boys Place, Christchurch 8001
ZL3PZ Jackson, W. B., 42 Churchill Street, Kaikoura 8280
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ZL3QC Mullis, Noel, 104 Mooray Avenue, Bishopdale, Christchurch 8005
ZL3QD Clark, E. R., 19 Farnswood Place, Redwood, Christchurch 8005
ZL3QE Browne, E. M. J., St Allisa Court, 46 Main South Road, Christchurch 8004
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ZL3QK Dawson, R., 41 Garlands Road, Christchurch 8002
ZL3QL Carrell, T. D., 33 Ryeland Avenue, Christchurch 8004
ZL3QN Barber, F. E., 20 Lomax Place, Christchurch 8004
ZL3QO Allan, J. M., Egans Road, R.D 1, Rangiora 8254
ZL3QQ Seed, T. J., 4 Westmont Street, Ilam, Christchurch 8004
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ZL3QT Delis, J. B. G., 455a Johns Road, Harewood, Christchurch 8005
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ZL3RA Riach, C. D., 25 Buffon Street, Waltham, Christchurch 8002
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ZL3RD Davey, D. R., 7 Westview Crescent, West Melton, R.D 6, Christchurch 8021
ZL3RE Bott, R. A., 9 Holmcroft Court, Cracroft, Christchurch 8002
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ZL3RQ Riordan, G. B., 25a Taylors Avenue, Christchurch 8005
ZL3RR North Canterbury Amateur Radio Club, see Branch Directory
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ZL3SA Gibbs, R. A., 97 Leaver Terrace, North New Brighton, Christchurch 8009
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ZL3SC Shearman, G. D., 68 Proctor Street, Christchurch 8005
ZL3SF Maloney, J. N., 31 Middlepark Road, Christchurch 8004
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ZL3SH Hardie, S. R., 245a Harewood Road, Christchurch 8005
ZL3SJ Fraser, G. J., 206 Major Hornbrook Road, Christchurch 8008
ZL3SK Pattrick, T. L., 46 Sherborne Street, Christchurch 8001
ZL3SL Leeming, D. S., 22 Karanga Road, Dunsandel, RD 2, Leeston 8151
ZL3SM Graham, B. N., 230 Esplanade, Kaikoura 8280
ZL3SMO May, Bryce, 156 Pages Road, Timaru 8601
ZL3SN Oldham, J. E., 40 Russell Street, Westport 7601
ZL3SO Kilkolly, J. W., 37 Haselden Street, Westport 7601
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ZL3TAM Details unknown
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ZL3TAR Visser, Hotse, 591 Barbadoes Street, Christchurch 8001
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ZL3TAT Baker, E. J. A., PO Box 65, Lake Tekapo 8770
ZL3TAY Ross, M. J., 32 Zephyr Terrace, Governors Bay, R.D 1, Lyttelton 8033
ZL3TB Somerville, J. D., PO Box 2936, Christchurch Mail Centre 8015
ZL3TBC Grenfell, A. D., 34 Massey Crescent, Christchurch 8001
ZL3TBD Symonds, A. C., 19 Stiles Place, Burwood, Christchurch 8006
ZL3TBE Pritchard, D. V., Address unknown
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ZL3TBQ Johnstone, D. E., 291 Burwood Road, Christchurch 8009
ZL3TBT Lee, M. O., 260 Cashmere Road, Halswell, Christchurch 8002
ZL3TC Smith, Marjorie, 15 Ferry Road, Spring Creek, Blenheim 7350
ZL3TCE Cobb, P. B., 2 Weymouth Grove, Wainuiomata 6008
ZL3TCF Pearson, M. B., Acheron Port Levy Road, Diamond Harbour 8030
ZL3TCG Deans-Syddall, J. M. (Mrs), 48 Hawthornden Road, Avonhead, Christchurch 8004
ZL3TCH Details unknown
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ZL3TCK Sands, A. J., PO Box 21-188, Edgeood, Christchurch 8030
ZL3TCL Details unknown
ZL3TCM Ramsey, R. B., 31 Rollesby Street, Hoon Hay, Christchurch 8002
ZL3TCR Gillman, Bev, 496 Tuahiwi Road, 1 RD, Kaiapoi 8252
ZL3TCT McCaw, R. C., 6 Farndale Place, Christchurch 8004
ZL3TCU Duxbury, J. S., 51 Aorangi Road, Christchurch 8005
ZL3TCV Garraway, W. A., 120 Warren Crescent, Hillmorton, Christchurch 8002
ZL3TCW Standeven, E. R., 24 Brynley Street, Hornby, Christchurch 8004
ZL3TDA Shaw, Graham, Address unknown
ZL3TDC Thomson, R. Y., 6 Princes Street, Temuka 8752
ZL3TDD Marks, J. W. J., 20 Dobson Street, Christchurch 8002
ZL3TDF Smith, B. A., "Charodale", Old West Coast Road, RD 1, Christchurch 8021
ZL3TDH Clark, N. L., 37 Radbrook Street, Christchurch 8004
ZL3TDK Emmett, B. A., 2 Betula Place, Queenspark, Christchurch 8009
ZL3TDL Wright, D. J., 5 Oakhurst Place, Russley, Christchurch 8004
ZL3TDN Tait, J. J., 101a Nayland Street, Christchurch 8008
ZL3TDR Smith, K. J., 10a Archer Street, Timaru 8601
ZL3TDS Taylor, E. G., 335 Hills Road, Christchurch 8001
ZL3TDW Hider, Denise, 12 White Street, Rangiora 8254
ZL3TDY Cavill, J. P., 36 Outram Grove, Kelson, Lower Hutt 6009
ZL3TDZ Boyer, P. J. (Mrs), 52a Dillon Street, Blenheim 7301
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ZL3TEP Dorward, I, 43 Alport Place, Woolston, Christchurch 8002
ZL3TEW Wilson, E. T. (Ted), 24 Collins Street, Ashburton 8300
ZL3TFA Hall, B. W., 27 John Street, Temuka 8752
ZL3TFC Dalton, T. P., 12 Peckham Lane, Christchurch 8006
ZL3TFD Rhodes, D., Rapaki, PO Box 44, Lyttelton 8033
ZL3TFI Wright, B. A., 21 Koromiko Street, Christchurch 8002
ZL3TFJ Lundy, R. J., 10 Alpers Place, Hillmorton, Christchurch 8002
ZL3TFK Weir, R. G., 64a Selwyn Street, Somerfield, Christchurch 8002
ZL3TFN Wood, K. L. B., 126 Pikarere Street, Titahi Bay, Porirua 6006
ZL3TFQ Dawkes, R. L., PO Box 14-012, Christchurch Airport 8030
ZL3TFR Smales, K. A., PO Box 13-926, Armagh, Christchurch 8031
ZL3TFS Soal, D. F., 13 Buckleys Terrace, Tinwald 8330
ZL3TFW Van Til, H. J., 6 Mulberry Lane, Redwood, Christchurch 8005

ZL3TFY

ZL3TFY Tizzard, R. W., 9 Chevy Place, Hoon Hay, Christchurch 8002
ZL3TG Copland, G. M., 11 Peel Street, Christchurch 8005
ZL3TGB Graham, J. C., 4 Ngaumatau Road, Point Howard, Lower Hutt 6008
ZL3TGG Groom, C. B. G., 18 Queens Avenue, Waikuku Beach 8254
ZL3TGM Flecknoe, G. A., 6 Kyeburn Place, Christchurch 8004
ZL3TGN Nalder, G., Waller Street, Murchison 7191
ZL3TGR Timewell, I. D., PO Box 706, Timaru 8615
ZL3TGS Oliver, A. J., 2/32b Huntsbury Avenue, Christchurch 8002
ZL3TGV Winslade, R. H., 15 Hunt Street, Timaru 8601
ZL3TGW Details unknown
ZL3TGX Henry, D. H., 34 Alexandra Street, Christchurch 8001
ZL3TGZ Moyle, C. M. (Mrs), 68c Clyde Road, Christchurch 8004
ZL3THB Cree, R. A., 18 Woolley Street, Christchurch 8007
ZL3THD Claydon, R. C., 22 Wendover Street, Bishopdale, Christchurch 8005
ZL3THI Wealleans, G. A., 37 Eglinton Street, Christchurch 8007
ZL3THJ Philpott, J. W., 11 Wardour Mews, Avonhead, Christchurch 8004
ZL3THP Platt, R. G., PO Box 59, Rolleston 8150
ZL3THQ Corbett, R. K., PO Box 5162, Papanui, Christchurch 8030
ZL3TIB Hely, M. O., RD 2, Christchurch 8021
ZL3TIC Foubister, M. A., 94 Hoon Hay Road, Hoon Hay, Christchurch 8002
ZL3TIG McNeill, R. G., 39 Hackthorne Road, Christchurch 8002
ZL3TIJ Wilde, R. C., 1 March Street, Spring Creek, Blenheim 7350
ZL3TIK Rodgers, P. N., 29 Porter Street, Ashburton 8300
ZL3TIL Errington, J. G., 11 Paparoa Street, Christchurch 8005
ZL3TIN Saville, P. G., 23a Tilford Street, Woolston, Christchruch 8006
ZL3TIQ McCorkindale, D. R., 94 Clark Road, Hobsonville, Auckland 1008
ZL3TIT Details unknown
ZL3TIW Platt, Bev, PO Box 59, Rolleston 8150
ZL3TIX Stevens, J. B., Sandy Knolls Road, R.D 1, West Melton, Christchurch 8021
ZL3TJA Thompson, D. A. J., Fairview, R.D 2, Timaru 8621
ZL3TJC Briggs, N. E., 124 Riverside Drive, Whakatane 3080
ZL3TJD Wilson, P. J., 111 Hornsey Road, Melrose, Wellington 6003
ZL3TJH Robinson, P. J., 10 Takahe Drive, Christchurch 8002
ZL3TJI Senior, G. J., Homle Station, RD 2, Timaru 8621
ZL3TJJ Ward, A. J., 178 Bridle Path Road, Christchurch 8002
ZL3TJL Lye, R. D., 7 Cromer Place, Christchurch 8007
ZL3TJM Dillon, G. A., PO Box 28-164, Beckenham, Christchurch 8030
ZL3TJN Hills, M. P., Wilsons Road, R.D 9, Feilding 5600
ZL3TJQ Details unknown
ZL3TJS Whitfield, B. W., 101 Soleares Avenue, Mt Pleasant, Christchurch 8008
ZL3TJT Nicol, J. R., 10 Lochee Road, Christchurch 8004
ZL3TJU McConnell, M. M. (Mrs), Orchard Reserve, 111 Gardiners Road, Christchurch 8005
ZL3TJW Rickard, B. S., 37 Nelson Street, Ashburton 8300
ZL3TJX Laughton, T. J., 12 Lancewood Drive, Westlake, Christchurch 8003
ZL3TJY Allan, S. E. (Mrs), Egans Road, R.D 1, Rangiora 8254
ZL3TJZ Hines, M. J., 34 Celia Street, Christchurch 8008
ZL3TK Martin, D. F., 19 Murray Street, Greymouth 7801
ZL3TKA Gumbrell, C. B., 17 Ropata Crescent, Naenae, Lower Hutt 6009
ZL3TKC Avery, F. E., 66 Mill Street, Westport 7601
ZL3TKD Godfrey, C. Y. (Mrs), R. D 2, Kaikoura 8280
ZL3TKE Details unknown
ZL3TKF Mollison, K. F. (Mrs), 11 Goya Place, Bishopdale, Christchurch 8005
ZL3TKG Neill, R. N., 39 Ellesmere Crescent, Palmerston North 5301
ZL3TKI Empson, T. M., 1 Allom Lane, Christchurch 8002
ZL3TKJ Forsythe, L. J., 65a East Belt, Lincoln 8152
ZL3TKL Details unknown
ZL3TKQ McInnes, G. W., 29 Harling Avenue, Hillmorton, Christchurch 8002
ZL3TKR Dwyer, D. S., 10 Helmsdale Street, Christchurch 8009
ZL3TKS Details unknown
ZL3TKV Lang, A. N., 62 Rahera Street, Christchurch 8002
ZL3TKW Williamson, I. S., Address unknown
ZL3TKX Patterson, H. W., 33 Leinster Terrace, Lincoln 8152
ZL3TKZ Details unknown
ZL3TL Paterson, M. S., 120 Hastings Street East, Christchurch 8002
ZL3TLA O'Donnell, L. A, 39 Melton Street, Timaru 8601
ZL3TLB Crawford, C. R., 89 Joseph Banks Drive, Whitby, Wellington 6006
ZL3TLD Dore, B. L., 66a Cottonwood Street, Parklands, Christchurch 8009
ZL3TLE Weir, D. R. (Mrs), 64a Selwyn Street, Somerfield, Christchurch 8002
ZL3TLG Steffensen, K. A., 10a Sefton Street, Belfast, Christchurch 8005
ZL3TLJ McConnell, D. A., Orchard Grove, 111 Gardiners Road, Christchurch 8005
ZL3TLN Digby, C. M. (Mrs), 4 Norfolk Street, Christchurch 8005
ZL3TLQ Harrall, E. D., 90 Gayhurst Road, Dallington, Christchurch 8006
ZL3TLR Lee, P. B., 23a Salford Avenue, Christchurch 8005
ZL3TLT James, K. D., 442 Pine Hill Road, Dunedin 9001
ZL3TLU Chapman, R. C., 16 Chardon Place, Western Heights, Auckland 1008
ZL3TLV Chapman, B. K. (Mrs), 16 Chardon Place, Waitakere, Auckland 1008
ZL3TLW Perry, S. J., 31 Fusilier Street, Hillmorton, Christchurch 8002
ZL3TLX Vickers, L. W., 17 Walkers Road, Lyttelton 8012
ZL3TM Buchanan, W. A., 1 Howell Street, Waimangaroa 7650
ZL3TMA Bettridge, M. J., 2 Cook Street, Carters Beach, Westport 7621
ZL3TMB Barnes, Mike, PO Box 218, Christchurch 8015
ZL3TMF Wilson, J. O., 15 Barnhill Crescent, Papakura 1703
ZL3TMG Davidson, F. W., 24 Roberts Road, Christchurch 8004
ZL3TMI Wilson, D. A., 58 Lane Street, Ashburton 8300
ZL3TMK Officer, B. C., 30 Peterhouse Street, Tawa 6006
ZL3TML Attewell, D. R., 40 Buchanans Road, Sockburn, Christchurch 8004
ZL3TMM Watson, P. M. J., 54 Kent Lodge Avenue, Christchurch 8004
ZL3TMP Pringle, N. F., Gladstone Street, Hawarden 8274
ZL3TMQ Pot, M. J., 6 Te Kiteroa Grove, Churton Park, Wellington 6004
ZL3TMS Seay, M. G., 6 Armack Drive, RD 5, Christchurch 8021
ZL3TMT Sullivan, B., 78 Rowses Road, Aranui, Christchurch 8007
ZL3TMW Squire, S. A., 33 Balrudry Street, Avonhead, Christchurch 8004
ZL3TN Dowling, D. W., 244b Otipua Road, Highfield, Timaru 8601
ZL3TNC Andrew, E. D. B., 448b Harewood Road, Bishopdale, Christchurch 8005
ZL3TNJ Davis, B., 40 Laing Crescent, Heathcote, Christchurch 8002
ZL3TNK Von Biel, H. A., 149d Major Hornbrook Road, Christchurch 8008
ZL3TNL Maunsell, P. B., Address unknown
ZL3TNO Pearce, S. J., 11 Melford Close, Rangiora 8254
ZL3TNQ Amtman, B. L., 28a Whitmore Street, Richmond, Christchurch 8001
ZL3TNR Details unknown
ZL3TNS Clay, P. D., 5 Appleby Highway, Richmond, Nelson 7002
ZL3TNT Fraser, Ann, PO Box 12, Waipara 8270
ZL3TNV King, J. H., 45 Roberta Drive, Christchurch 8002
ZL3TNY Brown, S. D., 78a Hackthorne Road, Christchurch 8002
ZL3TO Godkin, R. W., 147 Avondale Road, Christchurch 8007
ZL3TOA Gowers, R. J., PO Box 15, Hinds 8351
ZL3TOB Berry, R. D. E., c/- Electrical & Electronic Engineering Dept., University Of Canterbury, Private Bag 4800, Christchurch 8020
ZL3TOC Marshall, R. W., 19 Fraser Crescent, Twizel 8773
ZL3TOF Warren, P. A., 313 Wainoni Road, Christchurch 8007
ZL3TOH Fordyce, A. A., 28 Meadow Street, Christchurch 8005
ZL3TOI King, A. F., 2/363 Withells Road, Christchurch 8004
ZL3TOJ Meyers, D. R., PO Box 14, Rangiora 8254
ZL3TOL Gordon, R. A., 23 Harmans Road, Lyttelton 8012
ZL3TOR Details unknown
ZL3TOT Foster, P. J., 5a Vancouver Crescent, Christchurch 8006
ZL3TOV Martin, B. E., 26 Kaikoura Street, Maupuia Miramar, Wellington 6003
ZL3TOY Kenton, B. A., 44 Dickens Street, Addington, Postal: PO Box 33-044, Barrington, Christchurch 8030
ZL3TOZ Hurst, D. W., 31 Wakanui Road, Ashburton 8300
ZL3TP MacLean, A. G., 9 Horton Street, Pleasant Point 8772
ZL3TPA Layt, P. A., 15 Kerrs Road, Avonside, Christchurch 8006
ZL3TPC Calder, P. A., c/- Postal Agency, Inangahua Junction 7650
ZL3TPD Pitcaithly, D. J., 163 Wales Street, Halswell, Christchurch 8003
ZL3TPE Obers, W. L. T., 154 Ross Street, Invercargill 9501
ZL3TPJ Jarvis, Pauline, Sandy Knolls Road, RD 1, Christchurch 8021
ZL3TPL Details unknown
ZL3TPN Perkins, Nick, Doughboy Valley, Murchison, Postal: PO Box 86, Murchison 7191
ZL3TPO Turnbull, P. D., 21 Earp Street, Johnsonville, Wellington 6004
ZL3TPS Stewart, P. D., 12 Benmore Street, Timaru 8601
ZL3TPT Thompson, B. N., 172 Kilmore Street, Christchurch 8001
ZL3TPV Holland, D. J., 16 Maire Street, Tahunanui, Nelson 7001
ZL3TPW Burdekin, B. W., Address unknown
ZL3TPY Fotheringham, J. P., 35a Parnell Street, Lower Hutt 6009
ZL3TQ Agnew, G. A., 10 Robyn Place, Lincoln 8152
ZL3TQC Graham, J. N., 121 Rongotai Road, Kilbirnie, Wellington 6003
ZL3TQD Roxburgh, J. G., 13 Pound Road, Leeston 8151
ZL3TQE Aitchison, M. S., 61 Longfellow Street, Christchurch 8002
ZL3TQH Wiltshire, R., 25 Moreland Avenue, Papanui, Christchurch 8005
ZL3TQJ Morrison, L. I., Address unknown
ZL3TQX Slatter, S. E., 135 Sumnervale Drive, Christchurch 8008
ZL3TR Haynes, J. C., 26 Roosevelt Avenue, Christchurch 8001
ZL3TRB Brace, A. J., 14 Queen Street, Westport 7601

ZL3TRD Details unknown
ZL3TRE Cleine, N. C., RD 2, Utopia Road, Westport 7621
ZL3TRG Genet, R., 67a Winters Road, Redwood, Christchurch 8005
ZL3TRI Details unknown
ZL3TRJ Spurdle, D. P., 22 Giles Place, Shirey, Christchurch 8006
ZL3TRL Parker, G. T., 4 Margot Lane, Christchurch 8008
ZL3TRQ Quantick, L. H. (Miss), 4 Ayers Street, Rangiora 8254
ZL3TRT Sawyers, T., Cape Road, R.D 2, Westport 7621
ZL3TRX Hadler, D. J., Sandy Knolls Road, RD 1, Christchurch 8021
ZL3TRZ Anderson, J. C., 191 West Belt, Rangiora 8254
ZL3TS Phillips, S. J., 138 Hay Street, Linwood, Christchurch 8006
ZL3TSG van Royan, G. H., Engelbrechts Road, RD 8, Waimate 8791
ZL3TSJ Cole, G. J. (Mrs), Grange Settlement Road, Temuka 8752
ZL3TSM Miller, N. E. (Mrs), Whitewood Crescent, R.D 5, Christchurch 8021
ZL3TSW Details unknown
ZL3TT Symes, A. C. O., 783 Downs Road, RD 1, Rangiora 8254
ZL3TTA Roe, T. A., Main Road, Riwaka, R.D 3, Motueka 7160
ZL3TTB Bonzon, R. T. J., 11 Cron Street, Franz Josef Glacier 7952
ZL3TTD Details unknown
ZL3TTJ Townsend, J. S., 50 Condell Avenue, Bryndwr, Christchurch 8005
ZL3TTS Haywood, L. B., 45 Denise Crescent, Hornby, Christchurch 8004
ZL3TTU Details unknown
ZL3TTW Waters, B. M. T., 81b Eastern Terrace, Beckenham, Christchurch 8002
ZL3TUM Details unknown
ZL3TVA Hoving, J. P., 24 Royal Park Drive, Parklands, Christchurch 8009
ZL3TVH Hansen, V A, 638 Gloucester Street, Christchurch 8006
ZL3TVS Stubberfield, Vee, 138 Rutland Street, St Albans, Christchurch 8005
ZL3TW Riley, T. R., 20 Rearsby Drive, Halswell, Christchurch 8003
ZL3TWH Burrows, R. M., 25a Esperance Street, Christchurch 8005
ZL3TWO Details unknown
ZL3TWP Wells, M. E. (Mrs), 27 Samuel Street, Hoon Hay, Christchurch 8002
ZL3TX Strong, W. S., 20e Hackthorne Road, Christchurch 8002
ZL3TY McQuarrie, R. J., Weenink Road, Greymouth 7801
ZL3TYZ Details unknown
ZL3TZ Rio, N. N., 14 Gunson Street, Ponsonby, Auckland 1001
ZL3TZO Details unknown
ZL3UA Mulholland, F. S. T., 14 Penfold Square, PO Box 21, Leithfield Beach 8251
ZL3UAC Crosby, A. A., 13 Princes Street, Waikari 8276
ZL3UAD Woodfield, Alex (Mrs), 39 Aliford Avenue, One Tree Hill, Auckland 1006
ZL3UAR May, Aaron, 156 Pages Road, Timaru 8601
ZL3UBC Campbell, B. M., 37a Compton Street, Christchurch 8006
ZL3UBU Details unknown
ZL3UBV Details unknown
ZL3UBW Carran, P. S., 50 Bengal Drive, Christchurch 8002
ZL3UCD Andrews, Mark, 5 Heath Street, Christchurch 8005
ZL3UCK Blanchett, C. E. L., 59 Shakespeare Street, Greymouth 7801
ZL3UCL Lewer, C. J., 29a Wiremu Street, Papanui, Christchurch 8005
ZL3UCM Perrin-Smith, R. S., 1 Ida Street, Greymouth 7801
ZL3UCP Thomas, A. L., 37 Armott Heights West, Greymouth 7801
ZL3UD McConnachie, Margaret, Downs Road, RD 2, Darfield 8172
ZL3UDH Hetherington, D. J., 43 Otipua Road, Timaru 8601
ZL3UDJ Details unknown
ZL3UDR Robb, D. W., 1a Volcanic Street, Balmoral, Poatal: c/- Ihug, PO Box 7281 Wellesley Street, Auckland 1036
ZL3UDW Details unknown
ZL3UDZ Details unknown
ZL3UE Prattley, R. H., Ellesmere Road, RD 2, Christchurch 8021
ZL3UF Prue, B. O., 111 Union Street, New Brighton, Christchurch 8007
ZL3UFM Chilton, N. J., 71 Charles Street, Rangiora 8254
ZL3UFO Fraser, A. J., PO Box 12, Waipara 8270
ZL3UFS Details unknown
ZL3UFT Allan, D. T., c/- 74 Good Street, Rangiora 8254
ZL3UGB Details unknown
ZL3UGC Cook, G. J., 33 Normandy Street, Christchurch 8005
ZL3UGH Details unknown
ZL3UGT Turner, G., PO Box 11, Tai Tapu 8150
ZL3UGY Briggs, R. D. (Mrs), 32 Firth Street, Cobden, Greymouth 7801
ZL3UHF Details unknown
ZL3UHI Details unknown
ZL3UI Meredith, F. P. R., 6 Raymond Road, Bromley, Christchurch 8006
ZL3UIM Watson, S. (Mrs), 59 Rountree Street, Christchurch 8004
ZL3UKB Details unknown
ZL3UKM Details unknown
ZL3ULR Details unknown
ZL3ULW Willum, Lem, 97 Morses Road, Waiau 8275
ZL3UND Nelson, J. A., "Bleakhouse" Old West Coast Road, RD 1, Darfield 8172
ZL3UOK May, Stuart, 156 Pages Road, Timaru 8601
ZL3UP McNicholl, M. W., 4 Corfe Street, Christchurch 8004
ZL3UPH Lamble, R. P., 144 Queen Street, Westport 7601
ZL3UPJ Details unknown
ZL3UPS Scott, Patrick, Address unknown
ZL3UR South Canterbury Branch, see Branch Directory
ZL3URR Details unknown
ZL3USA May, A. P., 30 Nikau Place, Timaru 8601
ZL3USL Details unknown
ZL3UU Gordon, M., 3 Rydal Street, Christchurch 8002
ZL3UUC Details unknown
ZL3UVR Turner, M. H., 1 Pateley Lane, Aranui, Christchurch 8007
ZL3UX Vincent, L. L., Lismore, RD 5, Ashburton 8300
ZL3UXB Details unknown
ZL3UXP Boyes, K. M. (Mrs), c/- 6 Denley Gardens, Avonhead, Christchurch 8004
ZL3UXT MacKley, G. D. J., PO Box 7279, Sydenham, Christchurch 8035
ZL3UY Brown, A. G., 6 Stening Place, Brookdale Courts, Burwood, Christchurch 8009
ZL3UZ McKenzie, C. D., 17 Hulverstone Drive, Christchurch 8007
ZL3VA Williams, D. T., 13 Liggins Street, Burwood, Christchurch 8006
ZL3VAA Orchard, A. P., 53a Joyce Crescent, Postal: PO Box 105, Greymouth 7815
ZL3VAB Orchard, J. (Mrs), 53a Joyce Crescent, PO Box 223, Greymouth 7815
ZL3VAH Blanchard, H. E. G. (Mrs), 37 Reynolds Avenue, Bishopdale, Christchurch 8005
ZL3VAK Kennedy, Mark, 56 Domett Esplanade, Cobden, Greymouth 7801
ZL3VAL Boote, V. Z. (Ms), 8 Hinton Road, Karoro, Greymouth 7801
ZL3VAM Brook, P. C., c/- Waikuku Holiday Park, 1 Domain Terrace, Waikuku Beach 8254
ZL3VAN Tapp, H. L. (Ms), 8 Kitchener Place, Opawa, Christchurch 8002
ZL3VAP Petersen, V. A. (Mrs), 51 Derby Street, Westport 7601
ZL3VAS Stephens, L. C. (Ms), 78 Brougham Street, Westport 7601
ZL3VAT Axford, B. R., Omoto Valley Road, Greymouth 7801
ZL3VC McLaughlin, P. T., 42 Domett Street, Westport 7601
ZL3VF Kendall, J. D., 26 Pankhurst Drive, Woodend 8255
ZL3VG Burling-Claridge, J. A., 4 Coventry Street, Christchurch 8001
ZL3VHF Details unknown
ZL3VI Melhuish, B. J., 34 St Andrews Hill Road, Christchurch 8008
ZL3VII Details unknown
ZL3VIP McIsaac, Ivan, "The Shire", Powells Road, Oxford 8253
ZL3VJP Paynter, J. J., 42 Fortune Street, Mairehau, Christchurch 8005
ZL3VJX Milligan, T. J., 218 Condell Avenue, Bryndwr, Christchurch 8005
ZL3VK Lawrence, J. E., 25 Andrew Street, Timaru 8601
ZL3VL Uden, Elaine (Mrs), Cliffird Road, Hauwai, RD, Seddon 7353
ZL3VLF Briggs, D. J., Unit 14, 90 Pharazyn Street, Alicetown, Lower Hutt 6009
ZL3VLJ Melse, J., PO Box 304, Greymouth 7815
ZL3VLN Neame, Lance, 13 Cowper Street, Greymouth 7801
ZL3VML Venter, Mark, 30 Manor Place, Christchurch 8005
ZL3VN Bradley, J. N., 169 Weston Road, Christchurch 8005
ZL3VNB Bateman, Nelson, 44 Jollies Pass Road, Hanmer Springs 8273
ZL3VO Elder, J., 30 Maling Street, Christchurch 8006
ZL3VP Bradshaw, Gareth, 163a Ashgrove Terrace, Christchurch 8002
ZL3VQR Ramsay, Irene, 28 Cornwall Terrace, Balcairn, RD 2, Rangiora 8254
ZL3VR McMaster, Anne, 23 Greens Road, RD 1, Kaiapoi 8252
ZL3VRN Details unknown
ZL3VS Uden, B. G., Clifford Road, RD, Seddon 7353
ZL3VTV Moore, T. D., 18 Geraldo Place, Russley, Christchurch 8004
ZL3VV Christchurch West Amateur Radio Club, see Branch Directory
ZL3VW Winskill, I. E., Caverhill, No 1 RD, Cheviot 8271
ZL3VX Parry, R. I., 18 Sunvale Terrace, Christchurch 8002
ZL3VY Dixon, A. P., 16 Kildare Terrace, Lincoln 8152
ZL3VYL O'Malley, M. J. (Mrs), 72 Crofton Road, Christchurch 8005
ZL3VZ Paterson, A. J., 52 Cavendish Road, Christchurch 8005
ZL3WA Allen, R. W., 11 Cheam Street, Dallington, Christchurch 8006
ZL3WBA Anderson, Brian. M., c/- Westland District Council, 36 Wells Street, Hokitika 7900
ZL3WBD Mead, B. D., 16 Kalmia Place, Kaiapoi 5282
ZL3WC Reeves, N. J., James Street, RD 3, Hinds, Ashburton 8300
ZL3WDB Manson, D B, 7 Brockenhurst Street, Christchurch 8007
ZL3WDE Details unknown
ZL3WE Longson, H. J. O., 21 Kinnaird Place, Christchurch 8002
ZL3WEJ McIsaac, J. M., "The Shire", Powells Road, Oxford 8253
ZL3WFC Details unknown
ZL3WG Baird, J. F., 46 Tovey Street, Christchurch 8007
ZL3WGM MacDonald, Graeme, 11 Akaroa Street, Kaiapoi 8252

ZL3WH

ZL3WH St. Andrews College Radio Club, (Trustee: ZL3RJ), Papanui Road, Christchurch 8005
ZL3WIM Details unknown
ZL3WK Martin, E. (Mrs), 51 Skerten Avenue, Hornby, Christchurch 8004
ZL3WKT Allan, K. E. (Miss), Egans Road, R.D 1, Rangiora 8254
ZL3WL O'Connell, G. E., 31 Murray Street, Greymouth 7801
ZL3WM Oliver, J. A., 44 Main Road, PO Box 22, Tai Tapu 8150
ZL3WMD Dowle, W. M., Makura, Goose Bay, RD 2, Kaikoura 8280
ZL3WMK Details unknown
ZL3WMM Hay, G. M., 37 Chapel Street, Greymouth 7801
ZL3WN Askey, G., 106 North Avon Road, Christchurch 8001
ZL3WNP Details unknown
ZL3WO Welsh, L. D., 18 Woodlands Place, Christchurch 8007
ZL3WP Buller High School Radio Club, 51 Derby Street, Westport 7601
ZL3WPJ Jackson, Peter, 5 Lyall Terrace, Temuka 8752
ZL3WPS Semmens, Warren, 30 Frederick Drive, Dinsdale, Hamilton 2001
ZL3WPT McLaughlin, Kim, 42 Domett Street, Westport 7601
ZL3WQ Mackey, C. J., 1 Camp Street, Ahaura 7850
ZL3WR Martin, V. E., 51 Skerten Avenue, Hornby, Christchurch 8004
ZL3WU Wright, A. F., 65 Ludstone Road, Kaikoura 8280
ZL3WV Rigby, F., c/- "Montana", Domain Road, Oxford 8253
ZL3WX Smillie, B., 19 Greenfield Place, Christchurch 8005
ZL3WY Yeates, J. M. (Mrs), 69 St Andrews Hill Road, St Andrews Hill, Christchurch 8008
ZL3ZZZ McDonald, D. M., Knights Road, R.D 5, Christchurch 8021

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ZL4AA Otago Branch NZART (Inc), see Branch Directory
ZL4AAA Cooper, R. B., PO Box 330, Mangonui 0557
ZL4AAB Watson, J., 73 Forfar Street, Mosgiel 9007
ZL4AAK Devereux, R. L., Daniels Road, Kingsdown, RD 1, Timaru 8621
ZL4AB Gray, H. A., 102 Brownston Street, Wanaka 9192
ZL4AC Lowe, A. F., 287 Barrow Street, Bluff 9503
ZL4AD Cook, B. J., 24 Bayfield Road, Andersons Bay, Dunedin 9001
ZL4AF Falconer, A. E., PO Box 214, Gore 9700
ZL4AG Boshier, R. F., 30 Ayton Drive, Glenfield, Auckland 1309
ZL4AH Scudamore, E. G., "Fairview", Totness Street, Green Island, Dunedin 9006
ZL4AI Shore, K. H., 1 Upland Street, Dunedin 9001
ZL4AK Dowman, W. F., RD 54, Kimbolton, Feilding 5600
ZL4AL Eastern Southland Branch 08, see Branch Directory
ZL4AM Blair, J. G. H., 5 Merrie Creek Road, Clinton 9252
ZL4AN Shaw, M. Y., c/- NZMCA, PO Box 147, Papakura 1730
ZL4ANN Judson, Ann M., PO Box 2, Te Puke 3071
ZL4AO Allan, A. N., Charlton, No 4 RD, Gore 9700
ZL4AP Smith, R. C., 104 Retreat Road, No 2 RD, Invercargill 9521
ZL4AQ Whyte, R. A., 8 Margaret Street, Gore 9700
ZL4AR Cole, R. S., 46 Walton Park Avenue, Fairfield, Dunedin 9006
ZL4AS Gray, L. C., "Graylea", Stony Creek, RD 2, Balclutha 9200
ZL4AT Taylor, A. J., 37 Dipton Street, Invercargill 9501
ZL4AU Ernst, R. W., "Hollypine", Roslyn Bush Road, RD 2, Invercargill 9521
ZL4AV Christie, G. A., 37 Garnet Street, Gore 9700
ZL4AW Pickford, W. J., 29 Black Road, Otatara, 9 RD, Invercargill 9521
ZL4AX Sandford, H. D., PO Box 12, Birchleigh Village, Mosgiel 9032
ZL4AY McLeod, J. H., 81 Oreti Road, Otatara, RD 9, Invercargill 9521
ZL4AZ Sidey, T. K. S., 16 Tolcarne Avenue, Dunedin 9001
ZL4BA Jones, G. L., Address unknown
ZL4BB Williamson, T. J., Yacht *Capella*, PO Box 25-111, St Heliers, Auckland 1130
ZL4BD Helean, F. P., 3 Passmore Crescent, Maori Hill, Dunedin 9001
ZL4BF Smith, L. K., 114b Te Hono Street, Maungatapu, Tauranga 3001
ZL4BG Mitchell, J. R., 49 McKerrow Street, Dunedin 9001
ZL4BH East Otago High School Radio Club, (Trustee: ZL4FI), PO Box 58, Palmerston 9061
ZL4BI Caldwell, J., 54 Brydone Street, Edendale, Invercargill 9690
ZL4BJ Wickens, J. R., 9 Northfield Avenue, Opoho, Dunedin 9001
ZL4BK Details unknown
ZL4BM McCallum, R. H., Ashley Downs, RD, Clinton 9252
ZL4BN Collett, D. K., 1/26 Kingsway Avenue, Sandringham, Auckland 1003
ZL4BO Jackson, V. R., Milton Park, RD 1, Invercargill 9521
ZL4BS Aldridge, J. T., 87 Trevors Road, Ashburton 8300
ZL4BTB Details unknown
ZL4BU Stephens, R. D., 72 Wilfrid Street, Invercargill 9501
ZL4BW Williamson, B. C., Melmore Terrace, Cromwell 9191
ZL4BX Anderson, J. L., 757 Brighton Road, Brighton, Dunedin 9051
ZL4BY Jenner, M. G., 34 Marion Street, Hoon Hay, Christchurch 8002
ZL4BZ Eve, C. R., 181 Fairway Drive, Kamo, Whangarei 0101
ZL4CA Williamson, A. E., Leicester Street, Hampden 8950
ZL4CG Rackley, A. M., 36 Craig Hendry Street, Green Island, Dunedin 9006
ZL4CI Stronach, N., 78 View Street, Manapouri 9660
ZL4CJ O'Cain, P. J., Flat 1, 234 Barrington Street, Spreydon, Christchurch 8002
ZL4CJS Staynes, C. J., 2 Crewe Street, Mornington, Dunedin 9001
ZL4CO Smith, J. D., PO Box 98, Alexandra 9181
ZL4CP Shea, D. A., 3 Josephine Street, Greymouth 7801
ZL4CT Southland Boys High School Radio Club, (Trustee: ZL4LX), 215 Herbert Street, Invercargill 9501
ZL4CU Dudley, G. J., Pomona Road, RD 6, Invercargill 9521
ZL4CV McKenzie, J., 104 Trafalgar Street, Waiwhetu, Lower Hutt 6009
ZL4CW Barker, W. G., 30 Kowhai Avenue, Invercargill 9501
ZL4DB Browne, D. J., 133 Reservoir Road, Oamaru 8901
ZL4DD Van Veen, H. M. G., 161 Evans Street, Opoho, Dunedin 9001
ZL4DF MacDonald, V. E., 5 Perth Street, Mosgiel 9007
ZL4DI Bain, C. R., 24 McKerrow Street, Waverley, Dunedin 9001
ZL4DJ Baird, R. A., 87 Ventry Street, Alexandra 9181
ZL4DK Mulder, D. J., PO Box 396, Alexandra 9181
ZL4DN Sharp, J. R., 72a Bay View Road, Dunedin South 9001
ZL4DQ Maslen, I. A., 62 Chambers Street, Dunedin 9001
ZL4DR Irving, J. T., 28 King Street, Mosgiel 9007
ZL4DRB Bowie, D. R., 7 Middleton Road, Upper Riccarton, Christchurch 8004
ZL4DT Preddy, S. G., 105 Glenross Street, Dunedin 9001
ZL4DV Richards, P. D., 18 Holyhead Street, Outram 9055
ZL4DW Babington, A. M., 45 Thomson Street, Invercargill 9501
ZL4DX Brasell, C. R., 25 St Leonards Drive, St Leonards, Dunedin 9002
ZL4DY Daniel, E. H., 4 Reddecliffe Crescent, Ashburton 8300
ZL4DZ Willetts, N. E., 23 Yarmouth Street, Balclutha 9200
ZL4FA Spittle, B. J., 17 Pioneer Crescent, Helensburgh, Dunedin 9001
ZL4FB Details unknown
ZL4FC Dominey, R. J., 67 King Street, Timaru 8601
ZL4FD Hedge, H. G., 35 Weiti Road, Orewa 1461
ZL4FF Gillies, I. B., 7 Duncraig Street, Invercargill 9501
ZL4FG Russell, W. J., 106 King Street, Invercargill 9501
ZL4FH Hall, J. N., 8 Watkin Street, Pine Hill, Dunedin 9001
ZL4FI Askin, M. G., Moeraki, RD 2, Palmerston 9061
ZL4FJ Austin, F. J., 8 Dunblane Street, Dunedin 9001
ZL4FK Fisher, K. G., 7 Nepal Place, Christchurch 8005
ZL4FM Wilden, A. J., 19 Mooltan Street, Dunedin 9001
ZL4FOX Kindt, B., PO Box 640, Albany, Auckland 1330
ZL4FP McLeod, R. J., 134 Bay View Road, Dunedin 9001
ZL4FR Jeromson, W. J., 196 Highcliff Road, Dunedin 9001
ZL4FS Faulkner, D. N., 40 Wymer Terrace, Hamilton 2001
ZL4FV Willoughby, J. R., 116 Regent Street, Invercargill 9501
ZL4FZ Smart, R. G., 26 Olivine Street, Christchurch 8001
ZL4GA Homer, G. C., 5 Conway Street, Macandrew Bay, Dunedin 9003
ZL4GC Shand, T. J., 22a Gladstone Road North, Mosgiel 9007
ZL4GD Wilkey, T. G., 68 Marine Parade, Bluff 9503
ZL4GE Hurring, C. J., 1a Belmont Lane, Dunedin 9001
ZL4GF Balan, S. C., 45a Brandon Road, Glen Eden, Auckland 1007
ZL4GG Boddy, K. H., Address unknown
ZL4GI Details unknown
ZL4GJ Service, T. R., 5 Bremridge Place, Hamilton 2001
ZL4GK Colvin, L. J., 43 Riverside Road, Gisborne 3801
ZL4GL Gilder, N. J., 37 Pomona Street, Gore 9700
ZL4GM Ellis, D. N., Address unknown
ZL4GO Thomas, M. E., 27 Stirling Crescent, Mosgiel 9007
ZL4GP McCutcheon, M. C., 145 Tarbert Street, Alexandra 9181
ZL4GQ Southland Branch, see Branch Directory
ZL4GSW Whyte, G. S., PO Box 36, Portobello 9004
ZL4GT Skinner, L. C., 36 Daniels Road, Redwood, Christchurch 8005
ZL4GU Brentwood, P. L., Slopehill Road, RD 1, Queenstown 9197
ZL4GV Wilkey, D. G., 2/30 Simkin Avenue, Glen Innes, Auckland 1006
ZL4GY Wills, M. E., 181 Wilton Street, Rosedale, Invercargill 9501
ZL4HA Young, B. S., 9 Crescent Street, Purakanui, RD 1, Port Chalmers 9005
ZL4HC Waters, M. J., 6 Barling Street, Macandrew Bay, Dunedin 9003
ZL4HD Hardwick, T. R., 126 Barrow Street, Bluff 9503
ZL4HF Kindon, H. A. R., 10 Treffers Avenue, Rangiora 8254
ZL4HG McNeill, S. J. E., 44 Stanbury Avenue, Spreydon, Christchurch 8002
ZL4HI Bruce, F., 22 Reynolds Drive, Glenview, Hamilton 2001
ZL4HL Smirk, A. H. C., 76 Cannington Road, Maori Hill, Dunedin 9001
ZL4HM Whelan, M. L., 142 West Street, Invercargill 9501
ZL4HO Sutton, K. E., 97 Grey Street, Invercargill 9501
ZL4HP Rait, B. G., 42 Morton Street, Invercargill 9501
ZL4HQ Williams, J. C., 143 Albert Street, Invercargill 9501
ZL4HR Nisbet, G. J., 33 Sutcliffe Street, Dunedin 9001
ZL4HS Marsh, W. J., Address unknown
ZL4HT Powley, D. M. L., 22B Sea Vista Drive, Pukerua Bay, Wellington 6010
ZL4HU Holdom, Ken A., PO Box 7, Clyde, Central Otago (QSL via ZL2HU) 9180
ZL4HW Details unknown
ZL4HY Baxter, P. M. (Mrs), 456 Peninsula Road, Kelvin Heights, Queenstown 9197
ZL4IA Baker, J. C., PO Box 16, Wanaka, Central Otago 9192
ZL4IB Williams, R. F., c/- F. L. Williams, 12a Stuart Street, Levin 5500
ZL4IC Cockeram, M. R., 126 Argyle - Otahuti Road, RD 4, Invercargill 9521
ZL4IE Mason, J. A., 29 Cannington Road, Maori Hill, Dunedin 9001
ZL4IF Cameron, L. C., Corbett Road, RD 7, Ashburton 8300
ZL4II Hollebon, K. W., Irvine Road, 2 RD, Dunedin 9021
ZL4IJ Details withheld at call holders request
ZL4IK Emslie, C. R., 47 Barr Street, Dunedin 9001
ZL4IM Norton, J., c/- Private Bag, Pukerau, Southland 9700
ZL4IO Malkin, Melva, 4/412w Avenue Road, Hastings 4201
ZL4IQ Knowles, D. C., 28 Rata Road, Twizel 8773
ZL4IR Hartz, E. H., PO Box 9, Te Anau 9681
ZL4IS Smirk, B. A., 68 Cannington Road, Maori Hill, Dunedin 9001
ZL4IT Sawers, R. N., Address unknown
ZL4IX Hasler, D. G., 10 Meon Street, Oamaru 8901

ZL4IY Piercy, C. H., 11 Bamborough Street, Invercargill 9501
ZL4IZ Jeffery, I. W., 7 Point Bush Road, Waimate 8791
ZL4JA Birse, K. C., 14 Martbern Crescent, Christchurch 8005
ZL4JB Details unknown
ZL4JC McLennan, Elizabeth, PO Box 6394, Dunedin North 9030
ZL4JD Dudley, J. T., 11 Fraser Street, Waikiwi, Invercargill 9501
ZL4JF South Otago Branch NZART (Inc.), see Branch Directory
ZL4JG Gilchrist, Jeanne, 20 Saddleview Place, Fairfield, Dunedin 9006
ZL4JH Harrow, J. C., 529 Tweed Street, Invercargill 9501
ZL4JJ Ferris, R. J., 269 Stokes Valley Road, Stokes Valley 6008
ZL4JL Stewart, R. D., 4 Arawa Street, Gore 9700
ZL4JN Haig, A. V., 43 Melbourne Street, Dunedin 9001
ZL4JO Maley, G. K. (Mrs), Newhaven, RD 1, Owaka 9251
ZL4JP McKenzie, G. A., Waiparu, No 7 RD, Gore 9700
ZL4JQ Torrance, A. M., Address unknown
ZL4JT Jennings, J. T., 15 Coolock Crescent, Dunedin 9001
ZL4JU Middleton, C. H., Address unknown
ZL4JW Watson, R. J., 646 Peninsula Road, Queenstown 9197
ZL4KB Gearing, W. J., Felldene Farm, RD 2, Wakefield, Nelson 7181
ZL4KF France, K. N., Arthurton, RD 1, Gore 9700
ZL4KH Shine, D. H. J., 11 Northview Crescent, Roslyn, Dunedin 9001
ZL4KJ Robertson, D. C., 45 Maitland Street, Invercargill 9501
ZL4KM Craig, A. J., 71 Mackworth Street, Christchurch 8006
ZL4KN Details unknown
ZL4KO Williams, T. J., 8 Rob Roy Lane, Wanaka 9192
ZL4KP Cochrane, W. G., 19 Centennial Avenue, Balclutha 9200
ZL4KS Ross, L. A., 10 Roy Crescent, Concord, Dunedin 9006
ZL4KT Waring, D., 28 Killarney Street, PO Box 118, Waitati 9060
ZL4KU Taylor, S. J., 66 Royal Terrace, Alexandra 9181
ZL4KV Patton, J. A., 15 Kensington Place, Taupo 2730
ZL4KW Kibblewhite, K. C., PO Box 36, Arrowtown 9196
ZL4KY Details unknown
ZL4KZ Details unknown
ZL4LDS Strong, L. D., 29 Church Street, Mosgiel, Dunedin 9007
ZL4LE Evans, L. M., Tussock Creek, RD 6, Invercargill 9521
ZL4LH Milsom, P. S., C/- Post Office, Lake Hawea 9192
ZL4LJ MacKenzie, A. I., 24 Scotland Terrace, Green Island, Dunedin 9006
ZL4LK Whitty, M. J., 29/2 Will Street, Abbotsford, Dunedin 9006
ZL4LL Benson, J. A., 15 Heath Street, Andersons Bay, Dunedin 9001
ZL4LN Tall, E. J., 1 Murray Street, Mosgiel 9007
ZL4LO Bristow, H. E., 17 Glencarron Street, Alexandra 9181
ZL4LP Sellar, K. R., 34 City Road, Dunedin 9001
ZL4LR Hunt, F. G., 30a Dame Street, Waikouaiti 9063
ZL4LS Howie, G. A., Address unknown
ZL4LT Richards, F. B., 84 Onetaunga Road, Birkenhead, Auckland 1310
ZL4LU Costard, T. J., 17 Stirling Street, Andersons Bay, Dunedin 9001
ZL4LV Johnson, P. W., Saddle Hill Road, Fairfield, RD 1, Dunedin 9021
ZL4LX Evans, R. W., 558 Tay Street, Invercargill 9501
ZL4LZ Telford, B., Ruru Avenue, Otatara, RD 9, Invercargill 9521
ZL4MA Ferguson, T. R., 22 Turnbull Street, Invercargill 9501
ZL4MD Hayes, K. J., Ripponvale, RD 2, Cromwell 9191
ZL4MJ Mitchell, J. S., 109 Layard Street, Invercargill 9501
ZL4MK Kingston, R. W. G., 12 Kenilworth Street, Waverley, Dunedin 9001
ZL4ML Lamont, M. S., 3 Garden Place, Glenleith, Dunedin 9001
ZL4MM Murray, R. W., 101 Inniscort Street, Cromwell 9191
ZL4MO Askey, A. J., 30 Murano Street, Waverley, Dunedin 9001
ZL4MP Crichton, J., 17a Edwin Street, Dunedin 9001
ZL4MS Dalliessi, P. J., 127 Tuna Place, Onemana, RD, Whangamata 2982
ZL4MT Matthews, R. H. (Mrs), Main Road, Mokutua, RD 1, Invercargill 9521
ZL4MU Cook, R. K., 230 Crawford Street, Invercargill 9501
ZL4MV Dawson, G. L., PO Box 1516, Invercargill 9515
ZL4MW Ward, W. T. R., West Plains Road, RD 4, Invercargill 9521
ZL4MX Govan, W. A., 14b Ravelston Street, Dunedin 9001
ZL4MZ Sherlaw, W. G., 28 Soper Road, Wingatui 9007
ZL4NA Dinkelaar, F., 48 Cranbrook Avenue, Christchurch 8005
ZL4NAJ Johnston, N. A., 33 Matai Crescent, Timaru 8601
ZL4NAK Details unknown
ZL4NC Patterson, B. R., 66 Koremata Street, Green Island, Dunedin 9006
ZL4ND Fox, Jack, 17 Inglis Street, Mosgiel 9007
ZL4NF Fox, R., 26 Sarajevo Place, Massey, Auckland 1008
ZL4NH McRodden, P., 93 Tomahawk Road, Andersons Bay, Dunedin 9001
ZL4NI Braddock, Rae, 39 Norton Street, Gore 9700
ZL4NK Kan, N. C. Y., 90 North Road, North East Valley, Dunedin 9001
ZL4NO Davidson, M., 7 Jack Street, Invercargill 9501
ZL4NP Goodin, N. H., 325 Tomahawk Road, Dunedin 9001
ZL4NQ Queenstown Branch 75 NZART, see Branch Directory
ZL4NR McVie, K. R., 18 Grigor Street, Brockville, Dunedin 9001
ZL4NS Hagen, R. L., 23 Milford Street, Invercargill 9501
ZL4NU Mackay, A. J., "Glen Dendron", 9 RD, Oamaru 8921
ZL4NV Selwyn, T. A., PO Box 654, Timaru 8615
ZL4NW Lee, N. P. C., 51 Dome Street, Invercargill 9501
ZL4NX Eteveneaux, D. H., 46 Greenock Street, Dunedin 9001
ZL4NZ Reid, K. W., 14 Glenside Avenue, Christchurch 8004
ZL4OB Baird, O. L., 131 Nelson Street, Invercargill 9501
ZL4OC Smith, R. F., 48 Oates Street, Roslyn, Dunedin 9001
ZL4OD Parsons, R. D., 69 Oreti Street, Invercargill 9501
ZL4OE Cumming, C. T., 100 Doon Street, Waverley, Dunedin 9001
ZL4OI Sim, R. J., Gordon Road, RD 2, North Taieri, Mosgiel 9032
ZL4OL McAlevey, M. J., PO Box 22, Waitati 9060
ZL4OM McIver, P. D., 13 Albert Street, Springfield 8170
ZL4ON Summerell, B. W., 457 Racecourse Road, Invercargill 9501
ZL4OO Central Otago Branch, see Branch Directory
ZL4OR Reeves, W. A., 205 Tomahawk Road, Andersons Bay, Dunedin 9001
ZL4OT Smith, L. H., 10 Rangiora Terrace, Tahuna, Nelson 7001
ZL4OU North Otago Branch NZART, see Branch Directory
ZL4OW Vincent, S. V., 30 Charles Street, Weston, Oamaru 8901
ZL4OX Checketts, R. N., 21 Highfield Terrace, Invercargill 9501
ZL4OZ Adams, D. A., 47 Wray Street, Dunedin 9001
ZL4PD Neill, K. G., 38 Teignmouth Street, Green Island, Dunedin 9006
ZL4PE Blyth, B. W., 2 De Courcy Place, Avondale, Christchurch 8007
ZL4PF Lindsay, M. G., PO Box 17-023, Karori, Wellington 6033
ZL4PI Huband, G. J., Address unknown
ZL4PM Marsh, P., 33 Falcon Street, Kaikorai, Dunedin 9001
ZL4PN Skeet, B. R., 123 Dunstan Road, RD 1, Alexandra 9181
ZL4PO Price, L. J., 90 Malling Road, Redwood Valley, RD 1, Richmond 7031
ZL4PP Cairns, J. G., 35 Royal Terrace, Alexandra 9181
ZL4PQ Pryde, G. W., 20b Jellicoe Crescent, Dunedin 9001
ZL4PR Russell, P. F., 208 Vyner Road, Otatara, RD 9, Invercargill 9521
ZL4PT Thompson, K. P., 180 Mornington Road, Dunedin 9001
ZL4PV Virtue, A. D. S., Shropshire Street, c/- Post Office, Kingston 9660
ZL4PW Stevens, C. A. (Mrs), 49 Bringans Street, Alexandra 9181
ZL4PX McMillan, A. D. K., 22 Jameson Avenue, St Albans, Christchurch 8005
ZL4PY Ball, G. L., PO Box 171, Dunedin 9015
ZL4PZ Gilchrist, A. J. H., 20 Saddleview Place, Fairfield, Dunedin 9006
ZL4QA Grieve, L. M., 178 Kennington - Waimatua Road, Kennington RD 1, Invercargill 9521
ZL4QC Walton, A. D., 132 Martin Road, Fairfield, Dunedin 9006
ZL4QD Hand, K. A., 45 Aotea Street, Dunedin 9001
ZL4QE Pearce, B. H., Address unknown
ZL4QG Nilson, F. E. G., 19 District Road, Roseneath, Sawyers Bay, Dunedin 9008
ZL4QH Adams, R. J., 4a Wharfe Street, Oamaru 8901
ZL4QI McDiarmid, K. G., PO Box 131, Oamaru 8915
ZL4QJ Burtenshaw, J. S., 69 Galloway Street, Hamilton 2001
ZL4QK Cross, A., 5 Driver Street, Long Beach, RD 1, Port Chalmers 9005
ZL4QL Smithies, R. B., 51 Wyn Street, Christchurch 8002
ZL4QM McLaren, J. B., 8 Marlborough Crescent, Richmond, Nelson 7002
ZL4QN Bonney, J. E., 17 Duncraig Street, Invercargill 9501
ZL4QO Lawson, D., 30 McFadden Drive, Mosgiel, Dunedin 9007
ZL4QQ Marshall, W. H., 39 Bellona Street, St Kilda, Dunedin 9001
ZL4QS Lochhead, J. R., "The Balloon", RD 1, Kaitangata 9200
ZL4QT Donoghue, A. M., PO Box 4215, Mid Avenue, Wanganui 5031
ZL4QU Piper, R. V., Drysdale Road East, RD 2, Myross Bush, Invercargill 9521
ZL4QY Details unknown
ZL4RAE Rae, B. G., 25 Ettrick Street, Brockville, Dunedin 9001
ZL4RB Naish, A. W., 45 Ardgowan Road, Oamaru 8901
ZL4RC Wekking, J. H. J., 13 Hogan Place, Fairfield, Dunedin 9006
ZL4RD Perrin, L. D., 69a Otipua Road, Timaru 8601
ZL4RF Osborne, H. F., 8 Conway Crescent, Invercargill 9501
ZL4RH McIntosh, R. W., 59 Hamilton Street, East Gore, Gore 9700
ZL4RI Details unknown
ZL4RM Wijkstra, E., 28 White Street, Invercargill 9501
ZL4RN Donoghue, A. M., 110b Norfolk Street, St Clair, Dunedin 9001
ZL4RO Graham, J. D., 212 Broughton Street, Gore 9700
ZL4RP Gillions, R. M., 7 Maryport Street, Lawrence 9153
ZL4RQ Pycroft, B. E., 8 Orcades Street, Shirley, Christchurch 8001
ZL4RR Moore, J. S. F., 11 Bernard Road, Alberttown, RD 2, Wanaka 9192
ZL4RS Jonker, J. A., 5 Coles Street, Geraldine 8751
ZL4RT Smith, D. J., 181 Milton Street, Nelson 7001
ZL4RU Powe, R. L., PO Box 26, Palmerston 9061
ZL4RV Tamplin, A. F. K., 58 Cooper Street, Karori, Wellington 6005
ZL4RW Bailey, W. D., 35 Tyne Street, Roslyn, Dunedin 9001
ZL4RX Details unknown
ZL4RY Richardson, Joan, 87 Newcastle Street, Clyde 9180
ZL4RZ Jardine, M. A., 153 Eden Street, Oamaru 8901
ZL4SA Helm, P. D., 28 Stafford Street, Ranfurly 9071

ZL4SB Stevenson, D. J., 593 Highcliff Road, Postal: PO Box 9008, St Clair, Dunedin 9030
ZL4SC Rait, Marian, 31/f Signal Hill Road, Opoho, Dunedin 9001
ZL4SD Excell, R. A., 144 Te Anau Terrace, PO Box 7, Te Anau 9681
ZL4SE Brannigan, A. M., c/- 18 Holyhead Street, Outram 9055
ZL4SEA Rolton, G. L., 9 Worcester Street, Hampden 8950
ZL4SF Watt, B. F., 91 Weston Road, Oamaru 8901
ZL4SJ Bromley, I. J., 87 Manawatu Street, Palmerston North 5301
ZL4SL Pope, K., 28b Gilbert Street, Blenheim 7301
ZL4SM Finer, W. R., 7 Swanson Road, Henderson, Auckland 1008
ZL4SN McLeod, N. C., 65 Stuart Street, Oamaru 8901
ZL4SO Ellis, Kathy, 3 Hawera Road, Kohimarama, Auckland 1005
ZL4SQ Leadley, A. M., Mangaotaki Road, Piopio 2555
ZL4SR Fletcher, R. E., 19 Riverside Drive South, Lower Hutt 6009
ZL4SS Jury, L. S., 8 Beach Road, RD 1, Te Horo 5560
ZL4ST Beveridge, G. W., 83 Russell Street, Alexandra 9181
ZL4SU Murrell, I. G., 65 King Street, Te Kuiti 2500
ZL4SV Hayter, J. W., 22 Omapere Road, Kaikohe 0400
ZL4TA Millar, G. E., 18a Arun Street, Oamaru 8901
ZL4TAB Olsen, W. J., PO Box 29, Mosgiel, Dunedin 9032
ZL4TAC Parish, D. A., 25 Truscott Avenue, Johnsonville, Wellington 6004
ZL4TAD Details unknown
ZL4TAE Thomas, T. M., 105 Larnach Road, Dunedin 9001
ZL4TAF Bayliss, A., 13 Rata Drive, Otematata 8950
ZL4TAH Checketts, G. N., 21 Highfield Terrace, Invercargill 9501
ZL4TAI Calder, A. D., Fernhill, Ardgowan, RD 1D, Oamaru 8921
ZL4TAJ Paterson, E. G., Waianiwa, RD 4, Invercargill 9521
ZL4TAK Bowen, D. J., Aspiring Lodge, Corner Dunmore & Dunvegan Streets, Wanaka 9192
ZL4TAP Johnston, G. H. L., 230 Talbot Street, Invercargill 9501
ZL4TAQ Howell, A. D., 18 Beverley Street, Merivale, Christchurch 8001
ZL4TAR Kirkby, K. J., 5 Lesney Street, Maryhill, Dunedin 9001
ZL4TAY Field, E. T., 192 Lagan Street, Bluff 9503
ZL4TAZ Wade, R. B., 8 Harbour Heights, Waverley, Dunedin 9001
ZL4TB Campbell, A. J. N., 7 Myross Road, RD 6, Invercargill 9521
ZL4TBA Croy, P. R., 65 Shaw Street, Mosgiel, Dunedin 9007
ZL4TBC Details unknown
ZL4TBD Puklowski, N. A., 127 North Street, Ashhurst 5451
ZL4TBE Details unknown
ZL4TBI Thompson, E. R., 20 Taupiko Place, Green Bay, Auckland 1007
ZL4TBN Nelson, D. A., 24 Jensen Street, Green Island, Dunedin 9006
ZL4TBO Stewart, E. A., Main Road, Kuri Bush, Brighton 9051
ZL4TBR Cleaver, R. A. J., 53 Till Street, Oamaru 8901
ZL4TBS Anderson, M. H., PO Box 6273, Dunedin North 9030
ZL4TCA Griffith, I. W., 17 Gilmore Street, Dunedin 9001
ZL4TCB Walker, B. A., Goodwood Road, RD 1, Palmerston 9061
ZL4TCC Le Quesne, P. W. H., 23 Oriel Place, Pirimai, Napier 4001
ZL4TCD Todd, R. J., 30 Naumai Street, Gore 9700
ZL4TCF Norgrove, T. J., 9 Dakota Place, Waldronville, Dunedin 9006
ZL4TCI Barker, B. B., 53 Tahi Street, Mapua 7155
ZL4TCJ Wagener, A. R., c/- R. D. Wagener, Main Road, RD 4, Kaitaia 0500
ZL4TCN Holley, J. A. C., 44 Scotland Street, Roxburgh 9156
ZL4TCO Mooney, W. J., 21 Greenhill Avenue, Dunedin 9001
ZL4TCS Falconer, E. F., PO Box 214, Gore 9700
ZL4TCV Nixon, D. B., 89 Quebec Street, Mornington, Wellington 6002
ZL4TCW Smith, A., 64 Dome Street, Invercargill 9501
ZL4TDB Wilden, J. H., 46 Hocken Street, Dunedin 9001
ZL4TDE Gallagher, P. R., 112 John Sims Drive, Johnsonville, Wellington 6004
ZL4TDF Walker, J. D., 7 Meon Street, Oamaru 8901
ZL4TDG Details unknown
ZL4TDI Bowen, P. D. O., 207 Taieri Road, Dunedin 9001
ZL4TDJ Dingwall, A. B., 47 Gilkison Street, Dunedin 9001
ZL4TDK Dwyer, W. A., 21 Summertime Avenue, Dunedin 9001
ZL4TDL Jones, I. E., Ramsay Street, Allanton, RD 2, Mosgiel 9032
ZL4TDM McKeown, D. W., 61 Eden Street, Oamaru 8901
ZL4TDP Aronsen, P. G., 10 Girvan Street, Wallacetown, Invercargill 9502
ZL4TDQ Davidson, R. W., 48 Montrose Street, Invercargill 9501
ZL4TDR Zoest, A. R., 25 Jaunpur Crescent, Broadmeadows, Wellington 6004
ZL4TDT Johnson, W. A., 10/254 Main Street, Gore 9700
ZL4TDU Lynn, I. G., 26 Larkins Street, Dunedin 9001
ZL4TDZ Duffy, K. J., PO Box 6025, Invercargill North 9530
ZL4TFD Ball, D. R., 2c Towey Street, Oamaru 8901
ZL4TFF Bokser, D. L., 216 North Road, North East Valley, Dunedin 9001
ZL4TFG Neill, P. G., 38 Teignmouth Street, Green Island, Dunedin 9006
ZL4TFH Allen, M. F., 6 Croydon Street, Dunedin 9001
ZL4TFJ Shirreffs, C. S., 145 Scandrett Street, Invercargill 9501
ZL4TFL Collier, J. B., 86 Mailer Street, Mornington, Dunedin 9001
ZL4TFM Details unknown
ZL4TFP Bedford, W. M., c/- Milburn Gardens, RD 2, Milton 9250
ZL4TFR Waters, J. L., PO Box 11, Kingston, Southland 9660
ZL4TFV Calder, D. G., 13 Elgin Rise, PO Box 113, Winton 9662
ZL4TFW Gamble, A. A., 13c Seaview Road, Cable Bay, RD 1, Kaitaia 0500
ZL4TFY Craighead, G., 162 Balmacewen Road, Dunedin 9001
ZL4TGA Scott, P. R., 99 Gilkison Street, Dunedin 9001
ZL4TGB Grant, W. A., PO Box 375, Dunedin 9015
ZL4TGF Williams, G. B., 64 Forfar Crescent, Invercargill 9501
ZL4TGH Connolly, R. C., PO Box 1229, Dunedin 9015
ZL4TGJ Pettigrew, A. D., 384 McQuarrie Street, Invercargill 9501
ZL4TGM Black, W. A., Address unknown
ZL4TGP Watson, R. M., 21 Arcus Street, Whangarei 0101
ZL4TGR Watson, D. K., 114 Cannington Road, Maori Hill, Dunedin 9001
ZL4TGS Faulkner, D. L., 8 Grove Burn Road, Tuatapere 9655
ZL4TGT Gerrie, A. L., 56 Oakwood Avenue, Dunedin 9001
ZL4TGW Details unknown
ZL4TGY Parris, R. C., 57 Rata Drive, Otematata 8950
ZL4TH Larsen, S. N., 26 Columba Avenue, Dunedin 9001
ZL4THC Andrews, J. W. A., 94 Carnarvon Court, Invercargill 9501
ZL4THE Booth, A. W., 24 Arawa Street, Gore 9700
ZL4THF Burge, G. G., 34 Colmar Road, Howick, Auckland 1704
ZL4THG McAuliffe, K. J., 184 Morton Street, Invercargill 9501
ZL4THJ Rabbidge, M. J., "Crayburn Farm", Graham Road, RD 1, Tokanui 9671
ZL4THK Sinclair, D. H., 8 Argyle Street, Weston, Oamaru 8901
ZL4THL Davidson, R. J., Earnscleugh Road, PO Box 6, Clyde 9180
ZL4THP Da-Rin, K. J. V., 11 Ronay Street, Bradford, Dunedin 9001
ZL4THQ Crimp, G. R., 31 Davies Road, New Plymouth 4601
ZL4THT Blee, A. R., 7 Campbell Street, Alexandra 9181
ZL4THZ McLean, C. J., Longbush, RD 1, Invercargill 9521
ZL4TIA Larsen, C. M. (Ms), 26 Columba Avenue, Dunedin 9001
ZL4TIB Wallace, W. D., 17 Delphic Street, Sawyers Bay, Dunedin 9008
ZL4TIC Stewart, C. H., 29 Paisley Place, Invercargill 9501
ZL4TID McRae, G. F., 1 Hillcrest Avenue, Mataura, Invercargill 9690
ZL4TIE Barber, B. J., "Glencoe", RD 2, Invercargill 9521
ZL4TIG Hill, A. R. M., 16 Wyre Street, Kaitangata 9200
ZL4TII Peirson, W. E., 16 Gardiners Road, Bishopdale, Christchurch 8005
ZL4TIK Curline, A. J., 16 Derby Street, Green Island, Dunedin 9006
ZL4TIL Drage, I. J., 695 North Road, Invercargill 9501
ZL4TIM Watson, N. R., 59 Rountree Street, Christchurch 8004
ZL4TIO Moore, J. S., 10 Dalrymple Street, Pine Hill, Dunedin 9001
ZL4TIR Woodrow, P. J., PO Box 75, Stirling, Balclutha 9200
ZL4TIW King, D. J., Address unknown
ZL4TIY Larooy, G. M., 617 York Street, Hastings 4201
ZL4TJA Details unknown
ZL4TJB McCall, D. A., c/- A.G. McCall, 42 Filleul Street, Invercargill 9501
ZL4TJC Cavanagh, D. B., 74 Koa Street, Gore 9700
ZL4TJD Details unknown
ZL4TJH Balch, R. M., 23 Connell Street, Dunedin 9001
ZL4TJK King, A. E. J., Kaka Point, RD 1, Balclutha 9200
ZL4TJP Askin, Fay, Moeraki, RD 2, Palmerston 9061
ZL4TJS Holland, B. J., c/- Police Station, 32 Princes Street, Waikari 8276
ZL4TJT Holland, J. P., 3 Okiwa Place, Tirimoana, RD 1, Picton 7372
ZL4TJX Nicholls, M. A., 9 Werneth Street, Atawhai, Nelson 7001
ZL4TKD Dupont, C. C., 6 Lothian Crescent, Invercargill 9501
ZL4TKK Spence, R. W., Address unknown
ZL4TKN Details unknown
ZL4TKQ Tamplin, N. L. A., 58 Cooper Street, Karori, Wellington 6005
ZL4TKS Mason, E. C., 49 John Street, Ranfurly 9071
ZL4TLE Elliott, L. G., 36a Murano Street, Dunedin 9001
ZL4TLG McConechy, G. S., 71 Heywood Street, Invercargill 9501
ZL4TLH McDonald, A. H., 190 Morton Street, Invercargill 9501
ZL4TLI Wright, D. W., 309 Talbot Street, Invercargill 9501
ZL4TLL Blair, R. C. W., Taumata, RD, Clinton 9252
ZL4TLX Wark, W. J., 3 Dunrobin Street, Dunedin 9001
ZL4TM Duffy, W. J., PO Box 6025, Invercargill North 9530
ZL4TO Mann, I. A., 72 Greig Street, Broad Bay, Dunedin 9004
ZL4TON Details unknown
ZL4TP Garry, A. M., 4 Tilburn Street, Halfway Bush, Dunedin 9001
ZL4TPD Dennison, W. P., 301 Ythan Street, Invercargill 9501
ZL4TPJ Details unknown
ZL4TR Armstrong, E. W., 15 London Street, Weston, Oamaru 8901
ZL4TRM McLennan, R. N., PO Box 6394, Dunedin North 9030
ZL4TRS Details unknown
ZL4TRV Harvey, Simon, Proctors Road, The Cove, RD 2, Dunedin 9021
ZL4TRW Details unknown
ZL4TS Details unknown
ZL4TSA Aronsen, S. A., 10 Girvan Street, Wallacetown, Invercargill 9502
ZL4TSM Details unknown
ZL4TSR Details unknown
ZL4TT Carter, F. L., c/- 7 Matai Street, Ravensbourne, Dunedin 9002
ZL4TUC Details unknown
ZL4TUD McConnachie, N. E., Joseph Street, RD 1, Taieri Mouth, Brighton, Otago 9051

ZL4TV

ZL4TV Adamson, A. T., 311 Pine Hill Road, Liberton, Dunedin 9001
ZL4TWO Clarkson, D. J., 22 Jackson Street, Dunedin 9001
ZL4TX Stuart, B. E., 353 Highcliff Road, Dunedin 9001
ZL4UCZ Middlemiss, B. W., 112 Margaret Street, Invercargill 9501
ZL4UDM Details unknown
ZL4UHF Aldridge, S. J., 201 Dalziel Road, Dunedin 9001
ZL4UJO Watt, J., 91 Weston Road, Oamaru 8901
ZL4UPB Details unknown
ZL4US Lambert, M. G., 38 Ayr Street, Mosgiel 9007
ZL4USB Blair, P. J., 5 Merrie Creek Road, Clinton 9252
ZL4VAB Wilden, R. M. (Mrs), 46 Hocken Street, Kenmure, Dunedin 9001
ZL4VAC Bootsma, D., 17 Chelmer Street, Oamaru 8901
ZL4VAD Meikle, J. W., 15 Girvan Street, Oamaru 8901
ZL4VAG Brown, P. N., 25 Baxter Street, Balclutha 9200
ZL4VAP Popham, A. D., 47 Kelso Crescent, Invercargill 9501
ZL4VAQ Needham, J. W., 232 Spey Street, Invercargill 9501
ZL4VBB Robinson, J. P., PO Box 127, Alexandra 9181
ZL4VBM McMillan, B. A., 230 Kenmure Road, Dunedin 9001
ZL4VCC McCarty, Chris, 3 Ravelston Street, St Kilda, Dunedin 9001
ZL4VCR Simpson, R. K., 1018 Brighton Road, Brighton 9051
ZL4VCS Stephen, C. D., c/- 45 Ventry Street, Alexandra 9181
ZL4VDF Findlater, D. N., 41 Montague Street, Dunedin 9001
ZL4VDM Miller, D. R., 34 Herron Street, Brockville, Dunedin 9001
ZL4VEH Hunt, E. J., 691 Portobello Road, Broad Bay, Dunedin 9004
ZL4VGA Anderson, R. G., 121 Elgin Road, Mornington, Dunedin 9001
ZL4VGV Seidelin, G. R., 22 Maryhill Terrace, Mornington, Dunedin 9001
ZL4VGW Details unknown
ZL4VHF Details unknown
ZL4VHI Details unknown
ZL4VJS Shand, J. C., 344 Rockdale Road, Invercargill 9501
ZL4VM Marris, V. T., 7 Meridian Street, Port Chalmers, Dunedin 9005
ZL4VOW Watson, Owen, 103 Braeview Crescent, Maori Hill, Dunedin 9001
ZL4VPM Mortimer, V. P., 31b Weaver Street, Oamaru 8901
ZL4VRF France, R. E., 3 Muir Street, Green Island, Dunedin 9006
ZL4VT Eigensperger, E., c/- PO Box 1231, Rotorua 3215
ZL4VV Kempson, C. M., 399b Te Moana Road, Waikanae 6454
ZL4VWB Beyer, W. F. T., 132 Eden Street, Oamaru 8901
ZL4WA Scott, J. R., Cochranes Road, RD 7, Ashburton 8300
ZL4WAH Watson, Anne, 114 Cannington Road, Dunedin 9001
ZL4WAQ Jaquiery, S. G., 56 Royal Terrace, Dunedin 9001
ZL4WAT Details unknown
ZL4WCP Wishart, I. D., 32 Hamilton Road, Queenstown 9197
ZL4WDF Details unknown
ZL4WEK Krol, E., 23 Franklin Street, Dunedin 9001
ZL4WES Details unknown
ZL4WFA Details unknown
ZL4WJ Busby, Wendy, 21 Ferntree Drive, Wakari, Dunedin 9001
ZL4WRC Clark, R. W., 5 Lethaby Street, Abbotsford, Dunedin 9006
ZL4WW O'Brien, H. C. (W6YJG), 15125 Juniper Peak Road, Weed, CA 96094-968, USA
ZL4WWW Details unknown

SOUTH PACIFIC AMATEUR RADIO LISTINGS

Tonga

A35AP Umina, Anthony P., Saineha High School, Vava'u.
A35AT Pinkser, Kwndras, Yacht *Dolphin*.
A35BQ Davis, Billy D., Yacht *Kismet*.
A35BT Thee, Bruce W., Nuku'alofa.
A35CF Martens, Detlef, Fafa Island Resort.
A35CL Marshall, Alan C., Saineha High School, Vava'u.
A35CU Mathew, R Perkins, Lafalafa, Nuku'alofa.
A35DB Bowman, Dennis A., Pangai, Ha'apai.
A35DE Crane, Richard W., Yacht *Sea Crane*.
A35DM Dehonin, Marcel, Beach House.
A35EB Bloomer, Eulalia P., Yacht *Rhodora*.
A35ET Davis, Michael E., Yacht *Kismet*.
A35EX Pater, Joe, Nuku'alofa.
A35FL Mikalsen, Per A., Cruises Symphony.
A35FN Baechler, Cedric, Kahana Resort.
A35FP Poole, Michael F., Yacht *Nercus*.
A35FT Turek, Frank G., Good Samaritan Inn.
A35GS Stumpe, Elke G., Yacht *Antaia*.
A35HF Farley Jr, Harold C., Yacht *Airborne*.
A35HN Na'ati, Hama, Malapo, Tongatapu.
A35HY Yamaguchi, Hiroji, J.O.C.V. Office, Nuku'alofa.
A35IF Bannerdt, Scott P., Neiafu, Vava'u.
A35IV Harris, Patrick S., Saineha High School, Vava'u.
A35JC Lhamon, Joyce C., Yacht *Lyric*.
A35JS Williams, Jerrold R., Yacht *Havaiki*.
A35JU Umina, Leonard J., Saineha High School, Vava'u.
A35JX Watts, James G., Neiafu, Vava'u.
A35KB Burke, Fr. K., Nuku'alofa.
A35KG Gerhard, K., Yacht *UBI Bene*.
A35KK Seaman, Phillip J., Yacht *Mouse Pad*.
A35KY Yamamoto, Katsumi, Dateline Hotel.
A35LF Malu, Lemeki, Tofoa, Tongatapu.
A35LZ Kamon, Daniel, Kahana Resort.
A35MJ Downs, M. J., Kolofo'ou, Nuku'alofa.
A35MS Schuster, Manfred, Vaini Village.
A35MU Umina, Michael P., Saineha High School, Vava'u.
A35NE Homsany, Michael P., Yacht *Dolphin*.
A35NQ Hoshiyama, Koji, Dateline Hotel.
A35NZ Mizuno, Keiko, Pangai, Ha'apai.
A35OV Kimura, Yumi, J.O.C.V. Office, Nuku'alofa.
A35PC Hoshiyama, Setsuko, Dateline Hotel.
A35PZ Vakalahi, Pepe, P O Box 848, Nuku'alofa, Tongatapu.
A35RK Kidd, Paul R., Pangai, Ha'apai.
A35RV Munt, Robert B., Nuku'alofa.
A35SG Nagai, Shinji, J.O.C.V. Office, Nuku'alofa.
A35SK Thustroem, Alf R., Nuku'alofa.
A35SM Mizuno, Shigehiro, Ma'ufanga.
A35SO Behrndt, Klaus, Fafa Island Resort.
A35SQ Preston, Robert C., Dateline Hotel, Nuku'alofa.
A35SV Mccarthy, Joseph T., Yacht *Navigator*.
A35TG Gregory, Trevor G., Pangai, Ha'apai.
A35TU Umina, Anthony P., Saineha High School, Vava'u.
A35VR Reisenweber, Lee L., Pangai, Ha'apai.
A35VS Santameria, Victor, Saineha High School, Vava'u.
A35WA Beathold, Faibt, Heilala Guest House.
A35XU Dijkers, G. A. M. C., Khana Resort.
A35YH Hoshiyama, Yotaro, Dateline Hotel.
A35YY Yasaka, Yumi, J.O.C.V. Office, Nuku'alofa.
A35ZL Przygode, Manfred W., Fafa Island Resort.

Fiji

3D2AA Aisake, A., PO Box 4969, Lautoka, Fiji.
3D2AG de Ramon, A., PO Box 14-633, Suva.
3D2BA Best, H. J., PO Box 23, Sigatoka.
3D2CC Carter, T. F., Muscat Cove Resort.
3D2CM Northcott, R. L., PO Box 1168, Suva.
3D2CS Broadbridge, E. K., PO Box 1046, Suva.
3D2DG Goodger, James, PO Box 11-407, Suva.
3D2DI Smith, W. J., PO Box 184, Suva.
3D2DN Lucas, David, PO Box 283, Pacific Harbour.
3D2ER Singh, Raj, PO Box 184, Suva.
3D2ES Saphore, Edward, PO Box 12-758, Suva.
3D2HN Tikaram, Harry Narayan, PO Box 3210, Lami.
3D2JO Turaganivalu, J., 14 Alexander Street, Suva.
3D2KM MacKinnon, K., c/- F.S.C., PO Box 63, Lautoka.
3D2LD Damuni, Savenca, PO Box 90, Suva.
3D2MP Prakash, M., PO Box 5324, Raiwaqa.
3D2PS Schulz, A. F. P., PO Box 5372, Raiwaqa.
3D2QB Osterman, Allan, PO Box 736, Lautoka.
3D2RP Prasad, R., PO Box 184, Suva.
3D2SJ Dives, Steve, PO Box 1354, Suva.
3D2SS First Suva Scout Group, PO Box 2344, Government Buildings, Suva.
3D2TC Thompson, Craig, PO Box 273, Suva.
3D2UR USP Amateur Radio Club, PO Box 1168, Suva.
3D2YL Blisard, Karen S., PO Box 2474, Suva.

Cook Islands

ZK1AD Dean, Aporo, Arorangi, Rarotonga.
ZK1AH Hosking, Archer Snr, Nikao, Rarotonga.
ZK1AM Morris, Alfred, Matavera, Rarotonga.
ZK1AN Davis, Sir Thomas, Ngatangtia, Rarotonga.
ZK1AQ Malcolm, Roger, PO Box 7, Areora, Atiu Island.
ZK1AX Abbott, John E., PO Box 663, Rarotonga.
ZK1BK Allan, Norman, Titikaveka, Rarotonga.
ZK1BP Savage, Henry, Takuvaine, Rarotonga.
ZK1BS C Is. Boy Scouts, PO Box 491, Rarotonga.
ZK1BW Walters, Barry, PO Box 702, Rarotonga.
ZK1CG Rivera, Victor, Betela, Rarotonga.
ZK1CP Utanga, Anthony, PO Box 581, Rarotonga.
ZK1CV Blake, Rodger, PO Box 143, Pokoinu, Rarotonga.
ZK1CY Tupou, Tuatai, PO Box 768, Matavera, Rarotonga.
ZK1DD Clarke, Des, Aitutaki Island, South Cook Islands.
ZK1DG Goodger, James, c/- John Abbotts.
ZK1JD Ditchburn, Jim, PO Box 491, Rarotonga.
ZK1KH Holdon, Ken, c/- ZL2HU, P O Box 7, Clyde, Central Otago 9180, New Zealand.
ZK1MA Tupou, Tuatai, PO Box 768, Tauhunu, Manihiki Island.
ZK1TW Wichman, Tomoavao, PO Box 129, Rarotonga.
ZK1WL Latham, Warwick, Omoka, Penrhyn Island.

New Caledonia

FK1RF Chardola, Jean-Claude, Box 3111, 98846, Noumea.
FK1RO Szymanski, Pascal, Box 11-451, 98802, Noumea.
FK1RS Gallois, Jean-Pierre, 7 rue Calimbre, 98800, Noumea.
FK1RU Mignot, Jean-Pierre, Box 90, 98870, Bourail.
FK1SF Limousin, Claude, Box 3047, 98846, Noumea.
FK1SG Forzy, Michael, Box 2793, 98846, Noumea.
FK1SO Lehoux, Gerard, 22 Lot Leroux, 98810, Mont Dore.
FK1TK Rainer, Henri, 190 rue Boutmy, Box 4608, 98847, Noumea.
FK1TV Flotat, Leon, Box 3690, 98846, Noumea.
FK1UB Morignat, Claude, 64 Route Anse-Vata, 98800, Noumea.
FK1UC Cherrier, Yves, 86 Rue Durmont-Durville, 98830, Auteuil.
FK1UL Jauneau, Jean-Claude, Box 2100, Pont des Francais, 98810, Mont Dore.
FK1UM Janisel, Robert, Box 917, 98830, Koutio.
FK1UW Tardivel, Gouvlen, Box 1529, 98845, Noumea.
FK8AH Garbe, Robert, Box 4490, 98847, Noumea.
FK8AL Garbe, Jean, Box 3994, 98846, Noumea.
FK8BG Cullell, Gilbert, Box 3956, 98846, Noumea.
FK8BN Thiriet, Guy, Box 1491, 98845, Noumea.
FK8BR Ynet-Mine, Maurice, 98825, Pouembout.
FK8CA Gouillard, Alain, Box 131, 98830, Koutio.
FK8CC Deramane, Simon, Box 7514, 98801, Noumea.
FK8CP Touzard, Remi, Box 945, 98845, Noumea.
FK8CR Szymanski, Eddy, QSL to F6EWK.
FK8DD Torope, Samuel, Box 3040, 98846, Noumea.
FK8DI Rabu, Dominique, 5 rue C. Savoie, 98800, Noumea.
FK8DJ Kryger, Jean-Claude, 21 rue Charbonneau, 98800, Noumea.
FK8DK Florentin, Maurice, 24 rue Jules Verne, 98800, Noumea.
FK8DL Roussel, Jean-Claude, Box 8585, 98807, Noumea.
FK8DM Thouvay, Gilles, Box 2016, 98846, Noumea.
FK8DS Grilhault des Fontaines, Gabriel, Box 1197, 98845, Noumea.
FK8DX Marc, Joel, 38 rue de Verdun, 98800, Noumea.
FK8EB Pesnel, Henri, Box 9754, 98807, Noumea.
FK8EF Martin, Arsene, Box 3519, 98846, Noumea.
FK8EG Rozier, Jean, Box 71, 98840, Tontouta.
FK8EJ Lung Kong, Bernard, Box 672, 98845, Noumea.
FK8EM Wagner, Pierre, Box 3956, 98846, Noumea.
FK8ET Dufermon, Jean-Michel, Box 3859, 98846, Noumea.
FK8EV Juncas, Jacques, Internat, 98860, Kone.
FK8EW Leperlier, Karl, 6 rue du Collier Blanc, 98800, Noumea.
FK8EX Lesaulnier, Rene, 131 route de l'Anse Vata, 98800, Noumea.
FK8EY D'Hollande, Eugene, Box 2233, 98846, Noumea.
FK8FA Tuband, Aimee, Box 447, 98810, Mont Dore.
FK8FB Debien, Lionel, Box 428, 98845, Noumea.
FK8FC Tourette, Michel, Box 2309, 98846, Noumea.
FK8FG Lepelletier, Bernard, Box 6258, 98806, Noumea.
FK8FI Nagle, Alain, QSL to F6FNU.
FK8FK Torregrosa, Jean-Philippe, Box 8485, 98807, Noumea.
FK8FL Gazengel, Albert, Box 4561, 98847, Noumea.
FK8FO Chanaron, Jean-Paul, Box 7133, 98801, Noumea.
FK8FP Lesca, Pierre, Box A 2, 98848, Noumea.
FK8FR Nixon, John, Box 2319, 98846, Noumea.
FK8FS Todori, Georges, 47 rue du Dr. Drayton, 98800, Riviere Salee.
FK8FT Bertolino, Henri, Box 135, 98890, Paita.
FK8FU Montaigne, Daniel, QSL to NA5U.
FK8FX Mercier, Yvon, 16 rue Gal Sarrail, 98800, Noumea.
FK8FZ Blanchet, Yves, Box 11490, 98802, Noumea.
FK8GB Soares, Antonio, Box 3125, 98846, Noumea.

FK8GC Berniere, Charles, 16 rue Felix Broche, 98800, Noumea.
FK8GF Millot, Alexandre, Box 3977, 98846, Noumea.
FK8GG Ambrogi, Francois, Box 344, 98845, Noumea.
FK8GH Lebiez, Jean-Louis, Box 1094, 98845, Noumea.
FK8GI Lebiez, Francoise, Box 1094, 98845, Noumea.
FK8GJ Bourez, Marc, QSL to F6CXJ.
FK8GK Dumon, Patrice, Box 1468, 98845, Noumea.
FK8GL Delaveuve, Michel, Box 703, 98845, Noumea.
FK8GM Esposito, Eric, Box 4480, or via WB2RAJ, 98847, Noumea.
FK8GN Allegret, Alain, Box 133, 98850, Koumac.
FK8GO Kherzi, Michel, Box 447, 98810, Mount Dore.
FK8GT Debien, Philippe, Box 8340, 98807, Noumea SUD.
FK8GU Marrades, Jacques, Box 3528, 98846, Noumea.
FK8GV Delmas, Jean-Marie, Box 3818, 98846, Noumea.
FK8GW Enrico, James, Box 6008, 98806, Riviere Salee.
FK8GX Mahault, Michel, Box 806, 98870, Bourail.
FK8GY Bouleau, Joel, Box 7219, 98801, Noumea.
FK8GZ Gaveau, Emile, Box 2005, 98846, Noumea.
FK8HA Lefebvre, Patrice, Box 74, 98830, Dumbea.
FK8HC Petitjean, Franck, Box 7636, 98801, Noumea.
FK8HD Torregrossa, Marlyse, Box 8454, 98807, Noumea.
FK8HF Pebellier, Michel, 12 bis Rue Bureau, 98800, Noumea.
FK8HG Tual, Robert, Box 9053, 98807, Noumea.
FK8HH Roussel, Odile, Box 8585, 98807, Noumea.
FK8HO Hertzog, Pascal, Box 343, 98880, La Foa.
FK8HV Faidherbe, Alexandre, Box 4230, 98847, Noumea.
FK8HW Poitvin, Thibault, Box 170, 98829, Thio.
FK8KAB A.R.A.N.C., Box 3956, 98846, Noumea.
FK8KBS BBS de L'A.R.A.N.C., Box 3956, 98846, Noumea.
FK8KRU A.R.A.N.C., Box 3956, 98846, Noumea.
FK8PCT ATRASEC, Box 2793, 98846, Noumea.
FK8VHA Repeater, Box 3956, 98846, Noumea.
FK8VHM Pesque, Eric, 19 Rue J.B. Morault, "Berveley Park", 98800, Noumea.
FK8VHN Lavisse, Didier, Box 12, 98842, Noumea.
FK8VHS Rieux, Christine, Box 3956, 98846, Noumea.
FK8VHT Leclerc, Philippe, via F6AJA.
FK8VHY Prevostat, Dany, Box 3956, 98846, Noumea.

Solomon Islands

H44GP Pearson, G., PO Box 292, Honiara.
H44GR Richardson, G., PO Box 127, Honiara.
H44MS Steffen, B., see DL2GAC.
H44NC Caisson, N., PO Box 168, Munoa.
H44PT Taylor, P, see G8BCG.
H44SI Solomon Island Radio Society, PO Box 418, Honiara.
H44XJA Ashley, J., PO Box 986, Honiara.

NEW ZEALAND DEPENDENCIES—ZL5, ZL6, ZL7, ZL8, ZL9, ZLØ

ZL5 Antarctica

ZL6 NZART

ZL6A New Zealand Association of Radio Transmitters (Inc.), PO Box 40-525, Upper Hutt 6415
ZL6KCM Kapiti Coast Museum, 9 Elizabeth Street, Waikanae 6010
ZL6LH QSL to, PO Box 397, Papakura 1730
ZL6OTC New Zealand Old Timers Club (ZL), c/- P. C. Anderson, 32 Gilmour Street, Waihi 2981
ZL6QH Quartz Hill Amateur Radio Station, c/- Wellington Amateur Radio Club Inc., PO Box 6464, Marion Square, Wellington 6030
ZL6YL NZ Women Amateur Radio Operators, Trustee: Jill O'Donnell (ZL2DBO), 39 Lismore Street, New Plymouth 4601

ZL7 Chatham Islands

ZL7BGD Details unknown
ZL7NAA Tuanui, J. (Mrs), P.O. Box 154, Waitangi, Chatham Islands 8030

ZL8 Kermadec Islands

ZL9 Auckland and Campbell Islands

ZLØ Overseas Visitors

NON-TRANSMITTING MEMBERS

Avery, T. J., 51 Trinity Crescent, Napier 4001.
Bennett, R. B., Railview, RD 3, Ashburton 8300.
Binsted, W. J., PO Box 79, Matakana 1240.
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Ferguson, K. D., 3 Grove Lane, Pakuranga 1706.
Gaudin, D. A. J., 18 Trafalgar Street, New Plymouth 4601.
Gibb, A. N., 7 Elizabeth Street, Pukerua Bay 6010.
Gilbert, B., 257 Riccarton Road, Upper Riccarton, Christchurch 8004.
Gorman, J. G., ZL1269, 15 Clark Road, Pakpakura, Auckland 1703.
Gray, R. G., Paierau Road, RD 1, Masterton 5921.
Groes, S. H., PO Box 24-159, Manners Street, Wellington 6034.
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Herd, P. T., 17 Haunui Road, Pukerua Bay 6010.
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Hunt, K. W., 2/40 Clevedon Road, Papakura, Postal: PO Box 593, Papakura 1730.
Johnson, K. M., 7 Pinehaven Road, Upper Hutt 6007.
Johnson, H. M., 18 Victoria Street, Masterton 5901.
Johnson, L. M., 15 Field Street, Upper Hutt 6007.
Johnson, M. E., 15 Field Street, Upper Hutt 6007.
Kendrick, J., 33 Manu Crescent, New Plymouth 4601.
Lee, J. K., 17 Siska Place, Ilam, Christchurch 8004.
Lee, J. S., 17 Siska Place, Ilam, Christchurch 8004.
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Romanin, G, IV3573, PO Box 248, 33100 Udine
Ryan, R. B. H., c/- Unfill Communications, PO Box 75, Nahariya 22100
Samsu, B. S., YB0EBS, JL Flamboyan Raya 17, Rempoa, Jakarta 15412
Sangat Singh, 9M2SS, 111 Jin Terasek Lapan, Bangsar Baru, 59100, Kuala Lumpur
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Whelan, R C, G3PJT, 36 Green End, Comberton, Cambridge CB3 7DY
Whitcher, A E, G7JUL, 12 Battersby Street, Jericho Bury, Lancashire BL97SJ
Wilkinson, K. S., JG1YCI, C.PO Box 1748, Tokyo
Wills, A. R., VK4YAR, 58 Barber Road, Ferny Hills, Queensland 4055
Wilson, R. L., VK2ER, Glencoe Canobolas Road, Orange, NSW 2800
Young-Soon Park, 8 Samsun-Dong 3-KA, HL1IFM, Sungbuk-ku, Seoul

THE NZART RECIPROCAL LICENSING BUREAU

by RUSS GARLICK ZL3AAA

With appropriate licences and approvals, New Zealand radio amateurs may operate in some overseas countries. This is possible through "reciprocal agreements" between governments, through "Commonwealth recognition", or "guest licences". These three arrangements are distinctly different and apply in different countries in different ways.

It can be a lengthy business to get approval to operate in some countries. A residential qualification of months may be needed. Some countries prohibit portable and hand-held operation and may require that the station installation be inspected and tested. Procedures, rules and bands available vary considerably.

Council have appointed Russ Garlick, ZL3AAA, as the co-ordinator for the "NZART Reciprocal Licence Bureau." Should you contemplate an overseas trip, an early enquiry could assist you to obtain overseas operating privileges. Russ keeps information on the requirements and procedures that a ZL radio amateur should follow to operate in many countries. He can supply the address of the licensing authority with whom you should correspond in most countries, and the address of the IARU amateur radio society. It will be appreciated that a long lead-time is necessary in your dealings with overseas administrators.

Finally, it would be appreciated if you could provide Russ with copies of licences, regulatory brochures, etc., when you return, so that your experience can be used to assist others who travel.

The address is: Mr R. A. Garlick, ZL3AAA, 18 Harbour Road, Motueka. Remember to include your NZART membership number or a *Break-In* label.

To obtain an Australian Amateur Visitors Licence

To operate amateur radio in Australia, make application in person to any office of the Department of Communication who have offices in all main cities. A licence to operate will be issued "over the counter". The Department has available an information brochure (DOC 517) *Guide to Amateur Radio operators visiting Australia*, it has useful items.

The applicant is to present their current and valid licence held, or a copy of the licence certified to be true and correct by a person authorized to administer Oaths in the country of issue. A fee is charged. No prior application is necessary.

Providing documentation is in order there should be no difficulties in obtaining a licence by bona-fide visitors.

The kind of licence issued would be the equivalent of the applicants home licence. The operation of the licence must conform to Australian amateur band conditions and radio regulations.

To obtain a USA Amateur Radio visitors operating permit

New Zealanders who hold a valid Amateur Radio Licence issued by the New Zealand authorities are permitted to operate in the USA and the US possessions under the reciprocal agreement between our countries.

Under the FCC regulations, promulgated in 1999 no application is necessary and no permit is issued to operate.

During the periods of operating in the USA, you must carry proof of citizenship and your valid Amateur licence, issued by the country of citizenship.

There is no time limit you may operate but your home licence must be valid.

Visiting operators may not exceed the privileges granted to the US extra class licence.

Identification

Call-sign to be used: the letter/numeral designating the location of the transmission, ie, W9, W6, KH6, etc, by State, must prefix your New Zealand call, eg, "W6/ZL3AAA".

Guest Licences

New Zealand licenced operators can obtain a guest licence in the Republic of South Africa and Hong Kong.

Visitors to New Zealand

Intending visitors requiring information can do so from :

NZART Reciprocal Licencing Bureau
Russ Garlick ZL3AAA
18 Harbour Road, Motueka
New Zealand 7161.
Telephone/Fax (03) 528-7319
E-mail russzel@xtra.co.nz.

Visitors are also advised to obtain a copy of the NZART Call Book, which contains amateur frequencies, band plans, repeater locations, branch information and much other information. Callbook will be of assistance to amateur radio visitors travelling in our country and can be purchased from :

NZART Business Manager
P.O.Box 40-525, Upper Hutt
New Zealand.

The current price is $NZ20.

Short term

Any overseas amateur visiting New Zealand may be permitted to operate, while visiting this country for up to four weeks, on 144 MHz or above, under the following conditions:

1. No application need be made.
2. No fee is charged.
3. For a period of not more than four weeks.
4. They should be able, if necessary, to satisfy the Ministry of Economic Development that they hold a current licence and/or certificate equivalent to the New Zealand Limited or General qualification, valid for the term of their visit.
5. A copy of their current licence and/or certificate must be carried whilst in New Zealand.
6. Usage meets the requirements of the New Zealand Radio Regulations 1987 and conform to the terms, conditions and restrictions applying to amateur apparatus operating in New Zealand.
7. They operate using their home call-sign suffixed by ZL.

NOTE: Visiting amateur radio operators from countries not having formal reciprocal agreements with New Zealand may also operate HF bands up to 12 months. A permit is necessary from the Ministry of Economic Development. Application and requirement information is available from the Bureau. A two-month lead time is required by the Ministry of Economic Development to consider this class of licence.

CEPT Licensing

New Zealand amateur radio licences are now accepted by a reciprocal agreement with European Conference of Postal and Telecommunications Administration (CEPT).

Countries in this administration are: United Kingdom, Germany, Switzerland, Turkey, Yugoslavia, Vatican, Austria, Belgium, Czechoslovakia, Cyprus, Denmark, Finland, France, Greece, Hungary, Ireland, Iceland, Italy, Liechtenstein, Luxembourg, Malta, Monaco, Norway, Netherlands, Poland, Portugal, San Marino, Albania, Bulgaria, Peru, Israel.

New Zealand has implemented CEPT recommendation TR/61-01 and accordingly amateur radio operations may operate in any of the CEPT countries. No application or permit is necessary for visitors temporarily (two months) in these countries. For longer periods up to 12 months, providing the New Zealand licence is valid, it would be wise to seek advice from the licensing authority. Before departure ensure that your New Zealand licence has been endorsed to CEPT regulations by the Ministry of Economic Development (Radio Spectrum Division). While operating in CEPT countries the call-sign format is: that host country call-sign, stoke, the ZL call-sign. For example GM/ZL3..., OE/ZL2..., SM/ZL1..., DL/ZL4..., etc. Your valid New Zealand licence and current receipt of fee must be carried.

The visitor is advised that radio regulations vary in these CEPT countries and it is prudent to seek authoritative advice on regulatory matters such as frequency allocations. New Zealand Novice licences do not qualify for CEPT reciprocity: Limited and General licences only are acceptable.

The Reciprocal Licensing Bureau can supply the addresses of the licensing administrations in CEPT countries.

British Commonwealth Agreement

Holders of valid amateur certificates issued in Australia, United Kingdom, Canada, Cook Islands, India, Niue, Papua New Guinea, Zimbabwe and Irish Republic.

No prior application is necessary. A personal application should be made to an office of the New Zealand Ministry of Economic Development and a licence will be issued immediately over the counter. Applicants must submit:

1. A valid copy of the operating licence which must indicate the morse speed at which the applicant qualified.
2. A New Zealand postal address where all correspondence can be sent.
3. For British Commonwealth recognition the appropriate licence fee is payable based on length of stay in New Zealand.

Applicants with less than 12 wpm morse qualification will be granted a Limited licence. Higher qualifications can be obtained by passing the appropriate examination in the usual way. Applicants with 12 wpm or higher morse speed qualifications will be granted a General licence.

The New Zealand Radio Regulations governing amateur band operations must be adhered to.

Note

At the time this information went to print several countries have adopted lower speed Morse qualifications, ie, 5 wpm, for general class licences.

Visiting operators to New Zealand holding licences with 5 wpm speed may or may not be granted HF permits under current regulations. Such visitors applying for a HF permit will need to clarify this upon application.

MONITORING SERVICE

Monitoring Service Co-ordinator
TED MINCHIN
ZL1MT

The NZART Monitoring Service is part of the IARU Monitoring System. This system has been set in place by amateur organizations, each concentrating on their own country and region, and covers all amateur frequencies worldwide.

The aim is to record and report persistent non-amateur activities found in our allocated bands in order to effect their permanent removal.

The NZART Monitoring Service consists of a small group of enthusiasts who regularly record and report any intruder that they discover in the course of their normal radio activities. The basic information required can be seen on the accompanying report form. Most reports are send in monthly to the Co-ordinator. There is also a weekly Monitoring Service Net which operates on 3.705 MHz each Sunday night at 2130 New Zealand time using the special call-sign ZL6IW. The Monitoring Service Co-ordinator can also be contacted by telephone (07) 883-5716 or by Packet at ZL1MT@ZL1UX.HAM.NZL.OC. E-mail: tedm@xtra.co.nz

The Service relies heavily on reports from amateurs for its continued effectiveness. It takes little time to note down a few details and pop them in the post. All enquiries and reports are answered or acknowledged promptly.

The NZART has provided sophisticated and up-to-the-minute equipment for its Monitoring Service and we can provide accurate information on nearly all intruders found.

A signal identification tape cassette and booklet is available on request.

Our bands have been hard won—you can help NZART and IARU retain bands for our exclusive use. So please participate.

Ted Minchin ZL1MT
Monitoring Service Co-ordinator

NZART MONITORING SERVICE

REPORTER: _____

SUMMARY OF REPORTS FOR: _____

FREQUENCY	UTC	DATE	MODE	COMMENTS

STOLEN REGISTER

by
ROY SYMON
ZL2KH

The Stolen Equipment Register is operated by me on behalf of NZART, for the benefit of *all* radio amateurs and is only as effective as the rate of reporting thefts. Thefts are an invasion of privacy, traumatic, and anti-social. They can also be seen by some as being an opportunity for upgrading equipment at the expense of the insurance company. Whatever the attitude you take when you are robbed—please report the event to me so that it might be prevented from happening to someone else.

Details of stolen equipment to be notified to:

Roy Symon ZL2KH
25 Annandale Street, New Plymouth 4601
Telephone: (06) 758-2156.
Fax: (06) 758-2154
Cellular: (025) 245-1406
Email: zl2kh@taranaki.ac.nz

This is to be in writing and to include all relevant details such as: make, model, where and when stolen, and a copy of the notice from the Police verifying that the theft has been notified to them.

Any notification made to me by telephone, fax or Email must be confirmed as soon as possible, in writing, as accurate records are a necessity and help to prevent malicious or false reports getting into the system.

There should be a declaration from the owner that the equipment belonged to them and that, to the best of their knowledge, all the details supplied are true and correct.

A lot of the details I find necessary will not be published. The lists will only show the make, model, serial number, date stolen; whereas I would need to know the location, owner's name and address, Police station to which notification was made, etc.

Lists of stolen equipment will be published in *Break-In* with regular updates as and when necessary. Complete lists will be available on request, both to Branches and individual members—as well as lists to holders of junk sales, to dealers, and the like. Such requests should be accompanied by a stamped addressed envelope.

I have compiled a cross-indexed database so that any parameter can give a match or access—and it is possible to give an answer re listing or otherwise over the phone in a similar manner to that given to people purchasing a car—all care and no responsibility though as the list could never be guaranteed as being complete. I would merely be able to state that a particular serial number did or did not appear on the list.

The aim of keeping this register is to make stealing amateur equipment unattractive (or even downright repulsive) to the stealer; to prevent amateurs from purchasing stolen equipment and subsequently having it confiscated; and to recover stolen equipment for the rightful owner. The temptation to buy a very cheap rig that has fallen off the back of a truck should be resisted at all times—the next gear stolen could be YOURS!

Please notify me, as soon as possible, of any stolen equipment that is recovered—it can then be withdrawn from the register and will help me measure the success of the scheme.

Roy Symon ZL2KH, Manager
NZART Stolen Equipment Register

Where do I fit in?

As a radio amateur, your NZART Membership is vital to all of us.

Amateur Radio is an activity requiring international co-ordination in radio frequency spectrum matters. This is achieved through several international organizations and your support is needed.

Membership of NZART acknowledges importance for the continuance of amateur radio in New Zealand, of representation by radio amateurs to government and liaison between NZART and overseas amateur radio societies.

ITU—the International Telecommunication Union

The ITU is a United Nations Agency and can be viewed as an assembly of government representatives. See the ITU web page at www.itu.int. New Zealand is a Member and the New Zealand Administration is the Ministry of Economic Development. The MED spectrum management web page is at www.med.govt.nz/rsm.

Through its International Radio Regulations, the ITU allocates radio services to specific frequency bands. Member states are required to recognize these treaty provisions when licensing services to operate on specific frequencies within their own regulations and national boundaries. The ITU Radio Regulations also define the Amateur Service and the Amateur Satellite Service and set down other operating requirements.

Frequency band allocations and the International Radio Regulations themselves are reviewed at ITU World Radiocommunication Conferences (WRC).

The New Zealand Radio Regulations reflect the International Radio Regulations.

The International Amateur Radio Union (IARU)

The IARU is a Sector Member of the ITU where it represents the Amateur Services.. It is recognized by administrations as the appropriate body to make recommendations on amateur radio issues. The IARU is permitted to present papers for the information of ITU conferences.

The IARU is a worldwide voluntary federation of some 153 amateur radio societies, founded in 1925. New Zealand joined in 1929. The prime purpose of the IARU is the protection of the Amateur and Amateur Satellite Services. The IARU Constitution is at the IARU web page: www.iaru.org.

The IARU is co-ordinated by an Administrative Council (AC) comprising a President, Vice-President, and two representatives from each of the three Regions:

Region I covers Europe, Russia and Africa,

Region II the Americas, and

Region III the remainder including New Zealand.

One society provides the IARU Secretary and the IARU International Secretariat (IS), administrative services, currently the American Radio Relay League (ARRL).

The business of IARU is transacted at triennial regional conferences arranged in sequence so that one is held each year. The IARU member-societies of the Region meet at these regional conferences to discuss common problems, to find solutions, to determine policy, and promote international amateur radio.

Each Region has its own IARU regional organization. NZART is a founder and active member of IARU Region III. Founded in 1968, the IARU Region III Secretariat is in Tokyo. The affairs of the Region are attended to between conferences by Directors who are elected at the triennial conference.

NZART

Founded in 1926, NZART is the New Zealand radio amateur's society. The IARU Constitution recognizes only one member-society in each country. NZART is duty-bound to represent the interests of the Amateur and Amateur Satellite Services.

NZART is recognized by and makes representations to the New Zealand Administration, the Ministry of Economic Development, on behalf of itself and IARU.

NZART also makes presentations to IARU Regional Conferences and can influence IARU policies. The next IARU Region III Conference is in Darwin, Australia, in August 2000.

IARU representatives at ITU conferences

The IARU is represented at ITU conferences by a selected team of specialists in amateur radio affairs drawn from IARU societies worldwide.

For some important ITU conferences, a representative of the Amateur Service is included in national delegations from Member countries. Where appropriate, NZART finances an Amateur Service representative in New Zealand's delegation. There was an NZART representative on the New Zealand Delegations to ITU conferences in 1979 and in 1982.

The International Radio Regulations

A copy of the text of the regulations pertaining to Amateur Radio can be obtained on request from NZART Headquarters or from the "Study Guide" found at the NZART web page. A full copy of the Radio Regulations is available from the ITU Geneva but occupies several volumes, is also available on CD-ROM, and is very expensive.

The International Radio Regulations do not of themselves regulate radio amateurs. With the status of an international treaty, they set out what administrations are expected to impose by their own national regulations.

International problems for amateur radio

All classes of radio service compete for their share of the radio frequency spectrum. Most services wield strong influence at ITU conferences. Decisions made there are affected by many factors, political, economic and social. At times the conference atmosphere is hostile to amateur radio.

Some decisions take many years to implement. The patient pursuit of long-term policies is needed to ensure the future welfare of the Amateur and Amateur Satellite Services.

The cost of this continuing vigilance is high. It comes from the radio amateurs in national societies and from the devoted voluntary efforts by many amateur radio specialists. A small part of your NZART subscription is remitted to IARU Region III each year to help fund international activities.

Remember, there is no actual security for the Amateur or Amateur Satellite Service. Constant vigilance, with time and money to protect our regulatory provisions are needed. Remember, there is no actual security for the Amateur or Amateur Satellite Services. Constant vigilance, with time and money to protect our regulatory provisions are needed. Your continuing support is needed.

Further information

Enquiries on international radio matters are welcome at NZART Headquarters.

IARU

Administrative Council

President: Larry E. Price W4RA

Vice-President: David A. Wardlaw VKADW

Secretary: David Sumner K1ZZ

Region I:

Chairman: Lou v. d. Nadort PAØLOU

Secretary: "Tim" Hughes G3GVV

Region II:

President: Thomas B. J. Atkins VE3CDM

Secretary: Eduardo Estrada HC2EE

Region III:

Chairman: Fred Johnson L2AMJ

Director: (This duty is shared among the Directors)

IARU International Secretariat

Address: PO Box 310905, Newington, CT 06131-0905, USA

Secretary: David Sumner K1ZZ

IARU Region III

Secretary: Keigo Komuro JA1KAB. Box 73, Toshima, Tokyo 170-91, Japan

Chairman: Fred Johnson ZL2AMJ

Directors:
Young-Soon Park HL1IFM, Korea.
Yoshiji Sekido JJ1OEY, Japan.
Sangat Singh 9M2SS, Malaysia.

Monitoring System Co-ordinators:

International: Bob Knowles ZL1BAD

Region I: Ronald Roden G4GKO/4X8RR

Region II: Martin Potter VE3OAT

Region III: Arasu Monohar VU2UR

Beacon Project Co-ordinators

IARU Beacon Project: Bob Fabry N6EK

Region III: Jamie Pye ZL2NN

IARU Satellite Adviser

Hans van de Groenendaal ZS5AKV

IARU EMC Adviser

Christian Verholt OZ8CY

VIDEO TAPE LIBRARY

1. *All China RDF Competition*—a serious 30 minute look at Amateur Radio Direction Finding—an official sport in China.

2. *The Happy Flyers Techniques of RDF*—a 26 minute audio/visual presentation of the theory and techniques for VHF Radio Direction Finding.

3. *The Aerial Circus with Dud Charman G6CJ*—45 minutes. Verification of the theory of operation of a variety of VHF and HF antennas. See the theory confirmed by means of scale model antennas.

4. *Amateur Radio's Newest Frontier*—30 minutes. A recent production from ARRL. Looks at the Radio Amateurs' involvement in space.

5. *NAREC 50*—a 60 minute production by Branch 25. Looks at the Napier Conference and the 50th Anniversary of AREC.

6. *Communications—The Hidden Revolution*—135 minutes. An address and demonstration by the Engineer-in-Chief, New Zealand Post Office, on modern communications techniques and methods.

7. *The Integration and Launch of AMSAT OSCAR-10*—35 minutes. A preview of the presentation and launch of OSCAR-10 by Werner Haus DJ5KQ.

8. *The Wonderful Wide World of Amateur Radio*—27 minutes. Produced by JARL, a look at amateur radio in Japan.

9. *Bill Orr W6SAI Whakatane Conference Opening June 1988*—20 minutes.

10. *1987 Dayton Hamvention KG0P production*—30 minutes.

11. *ARRL's New World of Amateur Radio, 1988*—(via W6SAI).

12. *W6SAI Sunday 5-6-88 Lecture Linear Amplifiers*

13. *Component Identification—ZL1TOF*—18 minutes.

14. *Launch Ariane IV 15-6-88.*

15. *RSGB's Amateur Radio for Beginners*—43 minutes

16. *Waiting for the Big One*

17. *Fuji-2 JAS-1—Japanese Amateur Satellite 1B*

18. *Ham Radio in Space*—30 minutes—ARRL

19. *SAREX—Shuttle Amateur Radio Experiment*—19 minutes—ARRL

20. *"More than Radios" from Zman Productions*—this video is a very special message to amateur radio operators. It is a strong emotional video and not like any other video you have seen about amateur radio

21. *Getting started in Packet Radio*—from CQ Communications Inc. This video will help de-mystify the exciting but sometimes confusing world of Packet Radio

22. *Getting started in Amateur Satellites*—from CQ Communications Inc. Find out how to locate and track ham satellites with ease. A video filled with easy to understand advice and tips that can't be found anywhere else.

23. *Dayton Hamvention 1996*—Vaughan Henderson ZL1TGC.

24. *DXpedition May 1996 to Raoul Island ZL8RI.*

25. *What's Happening in ARDF*—7 minutes.

26. *ZL9CI—Campbell Island 1999—James Brookes 9V1YC*—60 minutes.

Further copies of this can be purchased at $35.00 plus p & p, through the following e-mail address: jamesb@pacific.net.sg.

Cost of hire for each video is $3.00 plus p & p.

Protect your hobby

Only sell transmitting gear to licensed amateurs

NZART MORSE TESTING SERVICE

Background

NZART offers a Morse testing service to candidates wishing to gain the morse qualification for Novice and General level amateur radio licences, under delegation from the Ministry of Economic Development (Radio Spectrum Division).

The NZART Morse testing service is managed by the Morse Examiner and a Deputy, who are Officers of NZART. The actual morse tests are administered by participating NZART Branches which are responsible to choose a Morse Tester and a Morse Supervisor from the members of their Branch.

The aim of the NZART Morse testing service is to provide convenient access to "on demand" Morse examinations around the country. It is especially valuable in locations where there is not a Ministry of Economic Development office. Candidates may choose to be examined by NZART or by the Ministry of Economic Development, as they wish.

There is one important difference between the service provided by the Ministry of Economic Development and the NZART. The NZART Morse Testers administer the tests locally, pass or fail the candidate on sending ability and forward the receiving scripts to the Morse Examiner for marking. The full results notification to the Ministry of Economic Development can be made only by the Morse Examiner or the Deputy Morse Examiner. This means that candidates sitting their examination with MOC, get an immediate Pass/Fail result and those sitting with NZART have to wait a few days.

More than 300 candidates have successfully sat their Morse examination with NZART since the service was commenced a few years ago.

How to participate

A candidate seeking a Morse test should contact the local branch of NZART and may expected to be offered coaching and testing, or referral to MOC, depending on whether the Branch is taking part in the Morse Testing Service, or not.

For a Branch to be able to offer a morse testing service, it must first choose a Morse Tester. This person must hold a current General Licence. A Morse Administrator is also required and must be a licensed amateur from the same Branch. NZART Headquarters is to be notified of the names, call-signs and contact details of the persons the Branch appoints to these roles. This information to be updated annually.

Once a candidate has contacted the local Morse Administrator, the Administrator will inform the Morse Examiner who will send an Examination Pack containing detailed instructions on what to do, plus the necessary forms and examination materials. Both computer generated tests and conventional cassette tests for 6 and 12 wpm are included in the pack. The test pieces are in Farnsworth format. Each Branch is responsible to provide the necessary hardware such as a cassette player, oscillator, key and earphones. For computer tests, a basic "XT" level or better PC is required. The computer tests require the "DOS" operating system.

Value to amateur radio

The Morse testing service provides low cost and convenient access to testing for all candidates. It also puts candidates in touch with their nearest amateur radio group and both may benefit from this contact. Most aspiring amateurs need some coaching in preparing for their examinations and some assistance after they are qualified. Many local amateur groups have had great success with this approach, welcoming and helping many people to obtain their qualifications. This is also an excellent opportunity for experienced individual hams to support their hobby in a practical way.

Contact details

The current NZART Morse Examination Officers are John Hill ZL2AYQ Morse Examiner Mike Kerr ZL2BCW Deputy

Postal address: Box 30399 Lower Hutt Wellington.

AMATEUR RADIO EXAMINATIONS

by
ANNE ANDERSON ZL1TAF
NZART Examination Co-ordinator

General

The amateur service is defined in the Radio Regulations as: a radiocommunication service for the purpose of self training, intercommunication and technical investigations carried out by amateurs, that is, by duly authorised persons interested in radio technique solely with a personal aim and without pecuniary interest.

Amateur operators are required by provisions of the Radio Regulations to hold an appropriate qualification before they may be issued with an amateur radio station licence.

There are three grades of Amateur Operator's Certificate as follows:

General Grade, Limited Grade, Novice Grade.

The examination for an Amateur Operator's Certificate is specified in the Radio Regulations.

Examination Structure

The examination comprises two sections: Combined Section A+B and Section C.

Section A+B comprises a multichoice written examination in Radio Regulations, the principles of electricity, radiotelegraphy, and radiotelephony, operating procedures, service codes and abbreviations as are applicable to the amateur service, and in the adjustment and operation of radio apparatus used in atypical amateur radio station.

Section C is a Morse operating test, both sending and receiving.

Requirements for Certificates

For a General Certificate, a pass at Genera/Limited level in Section A+B is required, and with a 12 words per minute pass in Section C.

For a Limited Certificate, a pass at Limited level in Section A+B is required

For a Novice Certificate, a pass at Novice level in Section A+B is required, and plus 6 words per minute in Section C.

Taking the Examination

The Examination Division of NZART conducts section A+B (written) on behalf of the Ministry of Economic Development (Radio Spectrum Management).

Sections A+B are taken together at one scheduled examination session.

The time allowed for the written portion of the examination is two hours, with an extra reading time of ten minutes.

Section C (Morse Test) is conducted by the Ministry of Economic Development (Radio Spectrum Management) or by NZART approved testers.

The Morse test may only be attempted when a pass in Section A+B has been recorded at the Novice grade level or at the Limited grade level.

The Morse operating test is in two parts, sending and receiving. Each part will last for three minutes, and will contain both figures and letters.

The sending test is to be by hand, and the receiving test is to be written.

Examination Pass Requirements

Section A+B (Radio Theory and Regulations) is in the form of a multiple-choice question paper of 60 questions, each question having four possible given answers, of which only one is correct.

Forty correct answers are required to obtain a pass for the General and Limited grades, and 30 correct answers are necessary to obtain a pass in the Novice grade.

Section C (Morse test): two errors are allowed in each part of the test, with three blemishes in the received copy being counted as an error. A blemish is regarded as any patched or otherwise imperfect character resulting from guesswork or bad writing.

A pass at a speed of 12 words per minute is required for the General grade, and at 6 words per minute for the Novice grade. A word is equivalent to five letters and a figure is equivalent to two letters.

Examination dates

Examinations for written Sections A+B of the Amateur Operator's Certificate are conducted by appointment with the NZART Examiners in the appropriate areas.

Applications for examination

Application forms for Sections A+B are available from the secretary of any Branch of NZART, from the NZART Examination Division, from the NZART web page www.nzart.org.nz.

Application to sit the Morse test should be made with the local examiner.

Examination Fees

Examination entry fees must accompany the application. Details of the fee structure are available from the above sources. The current fee for section A+B is $25.00

Examination Result Notifications

Following an examination each candidate will receive direct from the Examiner a Result Notification which will indicate the section taken, the result obtained, and a positive statement as to whether a full pass has been obtained in a particular section.

Formal Certificates

Formal Amateur Operator's Certificates will not be issued automatically to those persons who obtain a full pass in any grade.

Formal certificates will only be issued on request to the Ministry of Economic Development Radio Spectrum Management. It should be noted, however, that an examination result notification, which carries a statement that a full pass has been obtained in the relevant sections, would be sufficient evidence on which an application for an amateur radio licence for the appropriate grade can be made.

Examination Recounts

Applications for recounts of the marks awarded in Section A+B must be made to the NZART Examination Division no later than one month after the examination in respect of which the mark in question was awarded.

The prescribed fee of $10.00 must accompany the application for recount.

Exemptions

The holders of the New Zealand First or Second Class Radio Telegraph Operator's Certificate or their equivalent are granted full exemption. Holders of other Radio Certificates may be granted exemption from Radio Theory questions. Applications for exemption must be made to Ministry of Economic Development (Radio Spectrum Management) and accompanied by copies of the documentation the request for exemption is based upon.

Licensing of Amateur Stations

Applications for licences to operate amateur radio stations should be made to the nearest office of the Ministry of Economic Development (Radio Spectrum Management).

Application may also be made for a specific radio call sign, which if not already allocated, may be issued on payment of the specified fee.

Study Courses

Appropriate study information can be obtained form NZART PO Box 40-525, Upper Hutt, 6415, from the NZART web page www.nzart.org.nz.

Further Enquiries

Please direct enquiries about the Amateur Radio Examinations to:

NZART Examination Division, PO Box 40-525. Upper Hutt 6415

Telephone (+64 4) 528-2170
Fax (+64 4) 528-2173

E-mail zl1taf@xtra.co.nz or nzart@clear.net.nz.

Remember ...

Leave a three second pause between overs when working repeaters

To the Office Manager NZART
PO Box 40-525, Upper Hutt 6415

CHANGE OF ADDRESS NOTIFICATION

Name: _____ Call-sign: _____ Membership No: _____

Old Address:

_____

_____

_____

New Station Address:

_____

_____

_____ Post code: _____

Which address do you wish to appear in *Call Book*?

☐ Station ☐ Postal ☐ Both

(Please tick selection)

***Break-In* postal address (if different):**

_____

_____

_____ Post code: _____

Membership benefits include the automatic inclusion of transmitting call-sign holders address details in *Call Book* (published annually).

If you DO NOT wish your details published please sign below.

I DO NOT want my address details published by NZART _____

REMEMBER: If you change address you must notify the nearest office of the Ministry of Economic Development (Radio Spectrum Management), AND the Office Manager NZART.

Please post this form to the Office Manager NZART at the above address.

Terms, Conditions and Restrictions Applying to Amateur Radio Apparatus Licence

1. The licence permits the use of radio apparatus to conduct Radiocommunication for the purpose of self training, intercommunication and technical investigation other than for pecuniary gain.

2. The emission from amateur radio apparatus for any radiocommunication should be of the minimum bandwidth and power as is necessary to ensure a satisfactory service.

3. Power Limits for Amateur Radio Apparatus:

For Amateur Radio Apparatus the power limit shall be:

(a) Novice Grade:

The radio frequency power output shall not exceed 10 W mean power, or 30 W peak envelope power.

(b) Limited or General Grade:

The radio frequency power output shall not exceed 120 W mean power, or 400 W peak envelope power.

4. No licensee of amateur radio apparatus shall use, or permit to be used, any such apparatus for the transmission of international communications on behalf of persons not being authorized amateur radio operators unless such communications are specifically authorized by the countries concerned.

(a) The passing of brief messages of a personal nature on behalf of non-licensed people or organizations within New Zealand is permitted, provided no tolls, fees or other consideration shall be received or collected by the licensee of the amateur apparatus.

(b)The licensee of amateur radio apparatus may permit persons other than qualified amateur operators to use the apparatus to pass brief personal messages under the direct supervision of the licensee. Under no circumstances may persons other than the authorized amateur operators engage in calling or signing-off procedures, or manipulate the controls of apparatus.

5. The licensee is only permitted to use the frequency bands listed below for the grade specified on the front page of the licence.

6. Amateur Frequency Allocation Chart.

Frequency Band	Notes	Grade
1800–1950 kHz	3 and 6	General
3.50–3.90 MHz	1 and 3	General
3.525–3.625 MHz	1 and 3	Novice
7.00–7.10 MHz	1 and 2	General
7.10–7.30 MHz	3 and 8	General
10.10–10.15 MHz	1, 3, 6 and 8	General
14.00–14.35 MHz	1 and 2	General
18.068–18.168 MHz	1	General
21.00–21.45 MHz	1and 2	General
21.10–21.20 MHz	1 and 2	Novice
24.890–24.990 MHz	1 and 2	General
27.12 MHz	4 and 7	All Grades
28.00–29.70 MHz	2	General
28.10–28.60 MHz	2	Novice
51.00–53.00 MHz	3	Limited & General
144.0–146.0 MHz	1 and 2	All Grades
146.0–148.0 MHz	3	All Grades
430–449.75 MHz	2, 3 and 8	Limited & General
614–622 MHz	3 and 8	Limited & General
922–927 MHz	3, 4, 5, 9 and 10	Limited & General
1.24–1.30 GHz	2, 3 and 8	Limited & General
2.396–2.45 GHz	2, 3, 4 and 8	Limited & General
3.30–3.50 GHz	2, 3 and 8	Limited & General
5.65–5.85 GHz	2, 3, 4 and 8	Limited & General
10.0–10.5 GHz	2, 3 and 8	Limited & General
24.00–24.05 GHz	2 and 4	Limited & General
24.05–24.25 GHz	3, 4 and 8	Limited & General
47.0–47.2 GHz	2	Limited & General
75.5–76.0 GHz	2	Limited & General
76.0–81 GHz	2 and 3	Limited & General
142–144 GHz	2	Limited & General
144–149 GHz	2, 3 and 8	Limited & General
241–248 GHz	2, 3 and 8	Limited & General
248–250 GHz	2	Limited & General
275–400 GHz	3 and 5	Limited & General

Notes

1. These bands are available for use by all Amateur licensees at times of natural disaster in connection with international relief operations, subject to the approval of the Secretary.

2. The bands 7.0 to 7.1 MHz; 14.0 to 14.25 MHz; 21.00 to 21.45 MHz; 24.890 to 24.990 MHz; 28.0 to 29.7 MHz; 144 to 146 MHz; 435 to 438 MHz; 1260 to 1270 MHz (earth-to-space direction only); 2.4 to 2.45 GHz; 3.40 to 3.41 GHz; 5.65 to 5.67 GHz (earth-to-space direction only); 5.83 to 5.85 GHz (space-to-earth direction only); 10.45 to 10.5 GHz; 24.0 to 24.05 GHz; 47.0 to 47.2 GHz; 75.5 to 81 GHz; 142 to 149 GHz; and 241 to 250 GHz may also be used for amateur satellite communications.

3. These bands are or may be allocated for use by other services. Amateur licensees may not use them in a manner which interferes with such other services.

4. The frequencies 27.12 MHz (±163 kHz), 925 MHz (±4 MHz), 2.40 to 2.45 GHz, 5.8 GHz (±75 MHz); and 24.125 GHz (±125 MHz) are designated for industrial, scientific and medical (ISM) purposes. Amateur licensees operating on allocations within these limits must accept interference from ISM equipment.

5. Allocated for use by amateur licensees on a temporary basis until further notice.

6. Until further notice the following spot frequencies may not be used: 1800 kHz (+3 kHz); 1860 kHz (+3 kHz); 10.130 MHz (+3 kHz). 1850–1950 kHz may not be used in a manner which interferes with navigation uses of those frequencies.

7. Telecontrol and telemetry operation only. Power output is not to exceed 5 W mean power.

8. These bands are allocated for use by other primary services and Amateur usage is on a secondary service basis. Users of a secondary service cannot claim protection from harmful interference from users of a primary or permitted service to which frequencies are already assigned or may be assigned at a later date.

9. Services particularly sensitive to other RF energy sources operate in adjacent frequency bands. Amateur licencees will be required to immediately cease transmission in the event of complaints of amateur interference to these services.

10. Power output is not to exceed 25 W EIRP.

Access to other bands

Access on a temporary basis to the band 165 to 190 kHz is available to New Zealand radio amateurs holding a General grade licence. A special permit from the Ministry of Economic Development is required. The details are sent in a letter from the General Manager (Communications), Ministry of Commerce, published in *Break-In* December 1990, page 10.

A special permit is required from the Ministry of Economic Development by amateur stations wishing to operate in the band 50–51 MHz because this band is used by commercial television in New Zealand. Special conditions apply. The details are in a letter from the Ministry of Commerce published in *Break-In*, October 1990, page 4.

A copy of these letter can be requested from NZART Headquarters, PO Box 40-525, Upper Hutt or at nzart@nzart.org.nz. Please clearly identify the letter that you are requesting by giving year, month and page details.

Tell our Advertisers you saw it in Call Book!

THE NZART QSL BUREAU

The NZART QSL Bureau is one of a network of bureaux established throughout the world by the IARU to facilitate the exchange of QSL cards between NZART members and radio amateurs and listeners in other countries.

Outward QSL Cards

The service is free to both transmitting and non-transmitting members of NZART—non-members may make use of this service at a cost of **25c per card.** All QSL cards for forwarding to radio amateurs and listeners in New Zealand and overseas countries should be posted to:

The QSL Manager
NZART QSL Bureau
PO Box 857
WANGANUI

The **call-sign** of the station to whom the card is addressed should be printed **clearly on both sides of each card.** Sending your card to a DX-station's Manager? Write the Manager's call on the back of the card. (Cards are sorted using the call printed on the back of the card.) If you see fit not to write the recipients call-signs on the back of your cards, it is pointless to carry out the last instruction—we are not clairvoyants! Make sure that the letter V will read V, not U, etc. Remember that English is not the first language of everybody handling and receiving your cards!

Please sort your QSL cards into New Zealand call-district order (ie ZL1-2-3-4, etc), USA and Australian call-district order and all others in alphabetical order: eg A3, EA, ES, EU, G, GM, I, OK, S5, SM, UA, UN, UR, VK1-2-3, etc, W1-2-3, etc, YU, ZL1-2-3-4, 3D, 5W, 9A (USA prefixes are kept together—AA-K-N-W1-2-3 etc). **Please do not separate countries with rubber bands, strips of paper etc.**

Members must enclose a current year *Break-In* label with each posting. After complying with the above, sit back and be patient!

Inward QSL cards

The NZART QSL Bureau provides a **free inward service for all** New Zealand amateurs and listeners.

Collecting cards from the sub-bureaux by members and non-members

Please note that the sub-bureaux are arranged in call-district and a ZL1 living anywhere in New Zealand deals with the ZL1 sub-bureau, ZL2s with the ZL2 sub-bureau, etc. Supply your particular QSL sub-bureau listed below with a supply of **suitable size stamped self-addressed envelopes** to receive your incoming cards.Print your call-sign on the front of your envelopes as each sub-bureau deals only with call-signs, not with operators' names.

Some Branches have special arrangements for "Branch postings" in place with the appropriate sub-manager. Contact your local Branch secretary for information. (The possible provision of this service is totally the prerogative of the sub-managers and there is no compulsion on any person to be a party to any such collective scheme.) Envelopes should be numbered and "Last Envelope" marked on one so that the recipient knows when to renew the supply.

Any specific requests for forwarding cards should be printed on the back of the envelopes such as "send monthly" or "send when 10 cards" or "send when weighs 200 g", etc.

QSL sub-managers

ZL1

J. Small ZL1KQ, 32 Paddington Street, Glen Innes, AUCKLAND 1106.

ZL2

A. H. Marr ZL2AGY, PO Box 3, GREYTOWN.

ZL3

D. S. Leeming ZL3SL, 22 Karanga Road, Dundandel, RD 2, LEESTON.

ZL4

D. A. Adams ZL4OZ, 47 Wray Street, DUNEDIN 9001.

Your QSL Card

1. Should **not exceed 140 × 90mm** in size (over-sized cards suffer damage!).

2. Have all the necessary information on one side of the card—if you intend having a two-sided card, make sure your **call-sign** is printed on **both** sides.

3. Use Universal Co-ordinated Time (UTC) (formerly referred to as GMT, also referred to as ZULU time)—NZST or NZ Daylight Time is meaningless to 99.9 per cent of amateurs—and you do want a card back!

4. It is advisable to write out the name of the month to avoid confusion.

5. **Do not correct mistakes, make a new card out.** Altered cards are valueless to the recipient.

Any further information concerning the business of the QSL Bureau, or requests for info on DX station QSL Managers/direct mail addresses (we will do our best to assist!) can be obtained from the QSL Manager at PO Box 857, Wanganui.

PS! Special calls and DX-peditions

If you, or your Branch, put on a special event/contest station using a special call-sign allocation for the duration thereof, or partake in a DX-pedition, please notify the QSL Bureau Manager and supply him with the relevant QSL Manager info!

SHIFTING HOUSE?

REMEMBER TO ADVISE THE FOLLOWING

1. AMATEUR LICENCE

Inform the Radio Inspector at your nearest Ministry of Economic Development (Radio Spectrum Management).

2. *BREAK-IN* DELIVERY

Advise the Office Manager, NZART HQ
PO Box 40-525, UPPER HUTT 6415

of your new address. Mention your call-sign and Membership Number (see page 3–4).

This advice will be forwarded to the *Call Book* Call-sign Compiler who will amend your *Call Book* listing.

SUSTAINING THE AMATEUR SERVICE

A responsibility for each of us!

The amateur radio qualification is an achievable challenge to most people and is useful to career-seekers in our technological world. It shows aptitude and sincere interest in communications, and identifies an achiever. It can give a jump over others in this competitive world.

The late 1940s was a time with a ***wave of new entrants*** into amateur radio. Let us all try to promote a return to that level of interest! NZART Council encourages newcomers into Amateur Radio. This calls for the help of all radio amateurs. A challenge to all of us. Council has adopted the expression **THE NEW WAVE** to embrace initiatives and objectives to encourage new entrants.

1. The NZART Constitution in its OBJECT says:

"The objects of the Association shall be the maintenance and expansion of the Amateur Service in New Zealand by:

"(a) the encouragement of recruits into the Amateur Radio movement

"(b) the provision of guidance and instruction in radio techniques and operating

"(c) the promotion organization and conduct of activities on a national and local basis ...", etc.

2. These objects are further reflected in wording in the NZART Strategic Plan, in particular OBJECTIVE 2:

"To promote knowledge of amateur radio and encourage newcomers. To assist Branches in local activities, especially in schools. To provide education and training aids. To award suitable prizes and other recognition."

And, in the PLANS OF ACTION:

"To publish information in *Break-In*, training materials and aids, educational and publicity material."

3. The NAZRT Strategic Plan OBJECTIVE 3 states:

"To provide guidance and instruction in radio techniques and operating, and encourage practical experimentation."

With your guidance and your help, others too can experience the thrills of Amateur Radio. Active encouragement and support are sought from all NZART members and from all Branches to recruit newcomers and to run classes in preparation for the amateur radio examination.

Branches are encouraged to actively promote Amateur Radio. Master copies of brochures, posters and other leaflets and publicity material are available to Branches for this purpose, free of charge from NZART Headquarters.

A sticker is available to NZART members from NZART Headquarters for 50c each. This is for displaying in the rear window of vehicles to show your support in a national campaign to increase the awareness of Amateur Radio in the general population.

Many computer users are unaware of amateur radio and what it has to offer. You are encouraged to widely advertise the NZART World Wide Web page, www.nzart.org.nz

Simple-to-construct equipment is a way to show youth groups and other interested persons the fun of Amateur Radio. Show how inexpensive home-construction brings delight and excitement from the achievement of communicating without wires over long distances using self-built gear. Articles from *Break-In* may be freely photocopied and distributed for this purpose.

The Novice licence is an achievable challenge. Do you know anyone who has shown interest in Amateur Radio? A youth or grandchild perhaps? Spread the word by demonstration!

After passing the amateur radio examination, a call-sign is issued by the Ministry of Economic Development, a call-sign that is unique world-wide. The challenge to attain such an identifying call-sign brings its own rewarding fun.

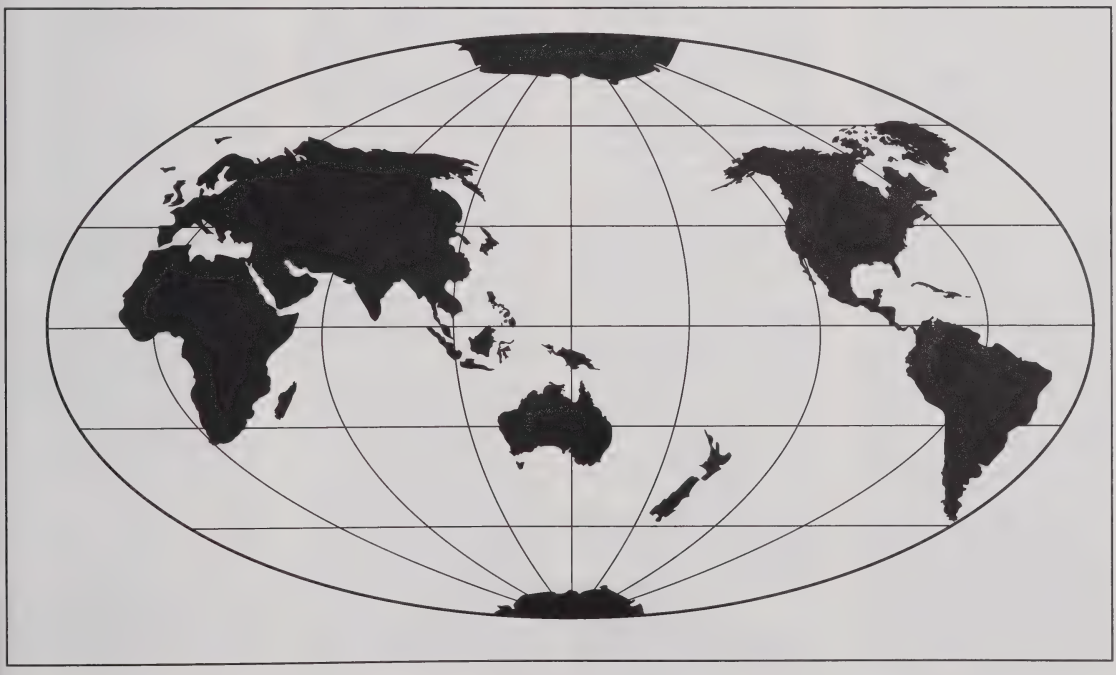
A local "group project", with the challenge to interest newcomers to develop their own local on-air amateur radio net, is worthy of consideration and encouragement.

The construction of receivers, transmitters and other projects under the guidance of experienced constructors at "club workshop nights" are worthy Branch activities.

Each Branch should appoint an "NZART Agent" as one of their executive, the task being to gain increases in NZART members, both Transmitting and Non-Transmitting, in their local areas.

A national and concerted effort by all New Zealand Radio Amateurs to ***promote Amateur Radio*** is necessary to ensure the continuation of a healthy and vigorous Amateur Service.

Help bring **THE NEW WAVE** of radio amateurs!



A GUIDE TO VHF AND UHF FOR NEW LICENSEES

Jane Atkinson ZL2QO, Jim Meachen ZL2BHF, Stephen McNeill ZL4HG

This article has been prepared by those listed above on behalf of the Wellington VHF Group, Branch 74 NZART (Inc.), PO Box 12-259 Wellington, to offer guidance to the newcomer to the wonderful world of amateur radio.

"Sam the Mobile Man" guest appearance courtesy of Sue Lill

© August 1994

Why such an article?

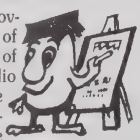
You've just got your licence. Your new rig has arrived today and is ready for use. You turn the power on. So, what do you do?

It can be pretty daunting when you first start out knowing what to say, or what not to say.

This article is designed to help you through your first few contacts. It's important to remember that there are no fixed rules. Many of the observations that are made in this article are the result of experiences we have had over a number of years, and you must remember that your operating may not necessarily cover what we've been interested in. So be it. This is a guide. Use it as a kind of *à la carte* offering of ideas.

The only way to become familiar with the operating procedures on VHF or UHF is to spend some time listening to the good operators, noting how and why their methods succeed where those of the poor operator do not. It is quite important as newcomers that you should be discriminating in this respect, and not simply mimic what you have heard when going on the air for the first time. To summarize, copy the good operators, and not the bad ones!

How this article is written



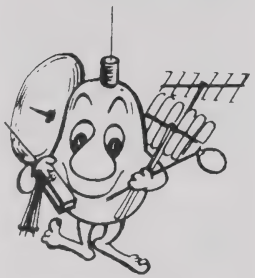
The article covers a number of different facets of amateur radio that you are likely to encounter in the VHF spectrum. You'll find these are often the same ideas you'll use on HF, but that kind of operating is beyond the scope of this article. You can find some excellent books on the general topic of operating, and you're encouraged to seek out the information contained therein. Some good examples of operating books, all of which can be obtained from NZART Headquarters, are as follows:

★ *A Guide to Amateur Radio*, Pat Hawker G3VA, RSGB, Nineteenth Edition.

★ *Amateur Radio Operating Manual*, R. J. Eckersly G4FTJ, RSGB, Third Edition.

★ *The ARRL Operating Manual*, edited by Robert J. Halprin K1XA, ARRL, Third Edition.

★ *AREC Manual*, NZART, 1978.



Some terminology

There are lots of words that are used everyday in the world of VHF in amateur radio. Among the most common are as follows:

AM Amplitude Modulation. A method of voice encoding a transmission which is seldom used these days. Specifically the strength of the signal transmitted varies with the strength of the voice signal.

AMSAT Amateur Satellite Corporation. An amateur radio organization promoting and developing the amateur satellite service. Over two dozen satellites have been built by amateurs worldwide and are universally available.

AREC Amateur Radio Emergency Corps. Groups of amateurs within NZART Branches who provide emergency communications in conjunction with other organizations as the situations demand.

ATV Amateur Television. The transmission of video signals by radio amateurs. This transmission can sometimes take place through a special kind of repeater.

Autopatch A device for interfacing a repeater to a telephone line. Such a device responds to audio tones generated by a telephone touch-tone pad connected to the user's rig or microphone.

Break The word used to interrupt a conversation on a repeater, often to indicate there is an emergency.

Call Book An annual publication by NZART that contains amateur call-signs, frequency allocations, repeater maps and other vital operating information.

Channel The pair of frequencies, input and output, used by a repeater.

Clear Indicates the end of a contact.

Coverage area the geographic area within which a repeater provides communications (sometimes called the footprint).

CQ A general call made requesting someone to talk to.

CTCSS Continuous Tone Coded Squelch System. (Sometimes known as PL or Private Line.) A sub-audible tone system used when you want to activate just one or a small number of remote receivers.

CW Continuous Wave. Commonly known as Morse code. Used in weak signal or long distance applications and sometimes in conjunction with amateur satellites. This is an "on-off" or dot-dash type of transmission.

Data repeater A repeater specifically designed for use in passing data, rather than voice communications. Of course, it may be used for both.

Digipeater A Packet radio repeater. Packet radio is a form of data transmission. Voice cannot be transmitted through a digipeater.

Dropping out The situation that exists, while you are using a repeater, when your signal does not quite have enough strength to keep the repeater triggered (see "Trigger").

DTMF Dual Tone Multi Frequency. A system often used for repeater control, using two tone frequencies. This control is often achieved by a simple keypad on your microphone or rig.

Duplex A mode of communication in which you transmit and receive simultaneously.

FM Frequency Modulation. A method of voice encoding a transmission, which is frequently used in conjunction with repeaters. Specifically, the strength of the signal transmitted is constant but its frequency varies with the strength of the voice.

FTMAG Frequency Management and Technical Advisory Group. A group that advises NZART on technical matters, particularly those relating to VHF and repeaters.

Full quieting A received signal that contains no noise.

Handheld A portable receiver that is small enough to fit in the palm of your hand.

Handle This refers to your name. Note, the term "personal" is not generally used in amateur radio.

Horizontal polarization The nominal orientation that a radiowave is taken to have as a result of an aerial's physical layout and orientation. Horizontal polarization is by convention very often used in weak signal applications at VHF/UHF.

Input frequency The frequency that the repeater receives on, and also the frequency on which you transmit to the repeater.

Magnetic mount (Also **Mag Mount**) A mobile antenna with a magnetic base that enables quick installation and removal from a car.

Ministry of Economic Development (Radio Spectrum Division) Ultimately responsible for the administration of all the radio frequency spectrum in New Zealand.

NiCd (also **Nicad**) A Nickel-Cadmium battery that may be recharged.

NZART New Zealand Association of Radio Transmitters (Inc). New Zealand's national amateur radio society, PO Box 40-525, Upper Hutt.

Offset The difference between a repeater's transmit and receive frequencies. In New Zealand this is plus or minus 600 kHz on the 2 m band and 5 MHz on the 70 cm band.

Output frequency The frequency that the repeater transmits on, and also the frequency on which your receiver receives the repeater.

Over The word used to indicate the end of a voice transmission.

Packet radio A way of transferring data or messages between amateurs across town, about the country or around the world.

Phone patch A device for interfacing the audio input and output of a radio transceiver to a telephone line.

RDF or **DF** Radio Direction Finding. The amateur technique of locating a transmitter.

Repeater trustee Person elected by an NZART Branch to take responsibility for proper operation of a repeater.

Roger The word that indicates all information was received correctly.

SAR Search And Rescue.

Simplex A mode of communications where you transmit and receive on the same frequency.

Sked A pre-arranged radio contact between two or more stations.

SSB Single Sideband. A method of narrow band voice encoding commonly used for long-distance or weak signal communications in both the high Frequency (HF), VHF and UHF parts of the spectrum. Very commonly used in conjunction with amateur satellites.

STSP Repeater Short Term Special Purpose **Repeater.** A repeater designed for emergency use or during special events.

Tone pad A device that is used to generate a standard set of tones that can be used to control certain functions on a repeater, or remote equipment (see DTMF).

Triggering To activate a repeater by transmitting on its input frequency.

Vertical polarization The nominal orientation that a radio wave is taken to have as a result of an aerial's physical layout and orientation. Vertical polarization is by convention very common in repeater operation at VHF/UHF. Antennas on handhelds when held upright and on cars are vertically polarized.

NZART

The New Zealand Association of Radio Transmitters (Inc) is New Zealand's representative society for radio amateurs. It provides a wealth of services to assist both the new and established amateurs. It publishes a monthly magazine (*Break-In*) and an annual Call Book. It represents the interests of amateur radio at both the national and international levels. It is controlled by an Executive Council elected by members. It has over 80 Branches throughout New Zealand, and has a membership of over 3000 amateurs.

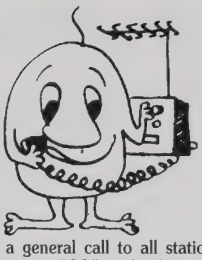
One of the services that is provided by NZART is the planning of band usage and the national coordination of repeaters and beacons. It does this based on the recommendations of its Frequency Management and Technical Advisory Group (FMTAG).

Inquiries about NZART services and membership may be directed to:

NZART Headquarters
PO Box 40-525
Upper Hutt

Establishing a call

There are two accepted way of establishing contact with another station. The first method is to put



out a general call to all stations, known as a "CQ", and to hope that another station responds. The second is to call another specific station by prior arrangement, known as keeping a "sked", or after the other station has just finished a contact or called CQ.

CQ calls are not normally made through repeaters. Instead, stations announce that they are "listening" on the repeater. For example, you might say:

"This is ZL2BHF listening seventen."

To start a sked with another station, you will call the other station by its call-sign, followed by your own call-sign, such as:

"ZL2QO, this is ZL4HG."

The station that is being called might have his or her call-sign repeated a few times, just in case they don't hear the single call. You might also be wise to issue your own call-sign in phonetics so that there is no mistake who you are. For example:

"ZL2QO, ZL2 Quebec Oscar, ZL2QO, this is ZL4HG, ZL4 Hotel Golf, ZL4HG."

However, remember that phonetics really only need to be used to clarify who you are in conditions that might make certain letters ambiguous, or where the band is noisy, or where your signal is likely to be weak. Over-use of phonetics is rather annoying, and time consuming.

Answering a call

You answer a CQ or sked call from another station in the same way that you would make the sked call in the first place. For example, in the above instance, where ZL4HG is trying to call ZL2QO, the latter station might answer the call in the following way:

"ZL4HG, this is ZL2QO ..."

and the conversation would continue. It's that simple!

How to pass transmission to another station

When you have finished saying what you want to say on one transmission, and you want the other station to reply, you do so by simply saying the word "over".

Before you say the word "over", you may want to indicate the other station's call-sign, and your call-sign too, in that order. Note that it is not absolutely necessary to give both call-signs at the beginning and end of each and every over, your own call-sign will suffice. But, if you do give the call-sign, you must give the full call-sign, not an abbreviated version. For example, use "ZL2BHF" and not "2BHF" or "BHF".

Letting other stations in

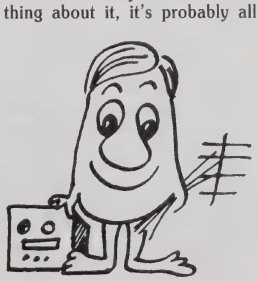
If you are in the middle of a conversation, and a station transmits his call-sign in the pause between transmissions, the next station in the queue to transmit should acknowledge that station and permit him or her to make a call and join the conversation. It is not polite to ignore him and, furthermore, it is rude to acknowledge him but not to let him speak. You never know, the calling station may need to use the repeater immediately. He may have an emergency on his hands, so let him make a transmission promptly.

Joining an existing conversation

If you wish to join a conversation that is already in progress, transmit your call-sign between transmissions. The station that transmits after you drop in your call-sign will acknowledge you, and usually invite you to transmit.

A brief pause, say three seconds, before you begin each transmission allows other stations to participate in the conversation. So don't transmit immediately that the other station stops. If you begin transmitting too quickly, you can prevent other stations from getting in. Also, there might be an emergency, so leave a pause!

Before you join an existing QSO, stop and think, "is it appropriate for me to join in?". If it's a technical matter and you know something about it, it's probably all



right. If it's on a more personal level, it might be better to wait until they have finished before giving a call, unless you know them fairly well. Either way, just give your call-sign and wait to be invited in. Jumping straight in with your comments is no better manners on the air that it is in person.

How to tell when it's your turn to talk

The station with whom you are talking will pass transmission back to you by one of the methods outlined above. Remember the pause before you transmit!

When and how often to give call-signs

A major source of frustration and annoyance to many operators can be the excessive use of call-signs. Take this example:

"Zl4 HG from ZL2BHF, are you parked yet Stephen? Over."

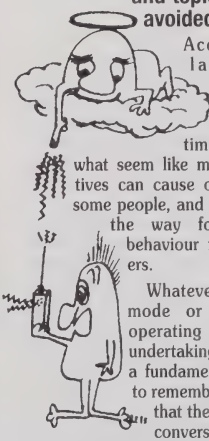
"ZL2BHF from ZL4HG. Yes. Over."

"ZL4HG from ZL2BHF, OK I'll see you later. Over."

"ZL2BHF from ZL4HG, over where, over."

We suggest you identify yourself at regular intervals, say once every ten minutes, as well as at the beginning and end of a conversation.

Standards of language, and topics best avoided



Acceptable language should be used at all times. Even what seem like mild expletives can cause offence to some people, and may pave the way for worse behaviour from others.

Whatever bands, mode or type of operating one is undertaking, there is a fundamental point to remember. That is that the "private" conversation with the other station is actually in public. Never discuss emotive subjects, such as politics, race or religion over the air to avoid the possibility of giving offence to others. Never give any information over the air which might be of assistance to the criminally inclined, such as the time that a house is unoccupied, dates of holidays, and valuables in the house. Telephone numbers, especially those belong to others, should be handled with considerable discretion.

Unidentified transmissions

Occasionally you may hear a conversation that you think you can enhance with a suitably witty addition, suitably anonymous. Don't be tempted to do so! All transmission must be identified! If you hear someone who appears to be a pirate, or who might perhaps be trying to bait the users of the frequency, don't rise to the bait—just ignore them. They will soon become bored and go away.

List of commonly heard Q Codes

Q Codes were originally developed for use with Morse code, to speed up the sending of commonly-used phrases. They are not strictly necessary when carrying on a voice contact, since it is usually just as quick to use the ordinary English equivalent: eg "Go to six-five-two-five" instead of "QSY six-five-two-five". However, some Q Codes are still used quite a bit on VHF and UHF. The more commonly used ones are:

QRM Interference
QRN Static
QRO High power
QRP Low power
QRT Cease transmitting
QRX Stand by
QRZ Who is calling? Who is there?
QSB Fading
QSO Contact, conversation
QSY Change frequency, go to
QTH Location

What a repeater is and how it works

A repeater is a special kind of transmitter and receiver combination that receives a signal and simultaneously retransmits it. A repeater situated on a vantage point such as a hilltop can dramatically increase the range of VHF and UHF communication in hilly areas and for users of low-power transceivers such as handhelds. To prevent the repeater from becoming unusable due to feedback, the receive and transmit frequencies are different. The difference between the two signals is known as the offset or split (see definitions).

To access a repeater, an amateur transmitter has to be set up so that it transmits on the repeater's input frequency and receives on the repeater's output frequency. Most (but not all) repeaters continue to transmit a carrier (known as the "tail") for a few seconds after the input signal ceases, so that the user can check that he or she is actually accessing the repeater. A list of repeater frequencies is given in Section 7 of this Call Book.

In New Zealand all repeaters are "open", that is, any licensed amateur is permitted to use the repeater without necessarily being a member of the local club. This is not necessarily the case in other countries.

Repeater timeouts

Some repeaters incorporate timing devices. These prevent an over from lasting longer than the time that the repeater is set to, usually two or three minutes. If a station transmits for longer than this, the repeater will cease retransmitting after the allotted time is up and a deathly hush will descend upon the frequency. The repeater timer resets when a new transmission begins. Two repeaters that currently incorporate this feature are Motueka 670 and Manawatu 910 (part of the National System).

Repeater alarms

Some of the more sophisticated repeater systems incorporate alarms to warn users of such things as power failure. Usually some kind of tone or signal will appear briefly at the end of each over.

The signal that appears after each transmission on Blenheim 695 is not an alarm but an identifier. It transmits the characters "BM" in Morse.

If you hear an alarm signal, first make a note of what type it is. If it is a digitized voice, what it is saying? Notify the repeater trustee as soon as possible (within reason—phone calls at 3 am are unlikely to be appreciated). If you don't know who the trustee is, get in touch with a committee member of the branch responsible for the repeater.

Most mains-powered repeaters have battery backup systems so that they can keep going if the power fails. As the repeater might have to remain on emergency power for some time, it is best not to use the repeater unless you really need to. Conserve emergency power for emergency use.

DTMF and CTCSS control codes

Some repeaters will respond to DTMF tones (see your transceiver manual to determine if your set can generate these tones). These fall into two main types: codes for use only by trustees for controlling repeater functions, and codes for use by amateurs in general. The most common in the latter group is the signal strength report generator. If a certain sequence of DTMF tones is transmitted, the repeater will respond with an indication of the signal strength it has received. The sequence of tones and the type of response received will vary from repeater to repeater. One thing remains constant with all of them: the need to IDENTIFY YOURSELF. Something along the lines of "This is ZL2BHF testing" is usually sufficient.

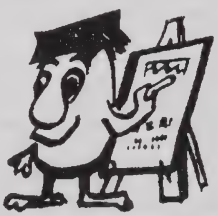
The uses of continuous tone coded squelch system (CTCSS) are many and varied. It may be used, for instance, by one station to contact a second without the second station being disturbed by other stations on the frequency. This may be useful when a station is waiting for a specific station to talk, but it is not the way most of us operate. A second use of CTCSS is as a warning that your station is being called, without necessarily locking out other stations. Manufacturers offering CTCSS facilities on their rigs often do so in a way that makes these facilities specific to their products; this may limit the usefulness of this feature. So, you should consult other amateurs before you use these facilities.

The National System

The National System is a series of dedicated linked high-quality repeaters on the 70 cm band. When a station accesses one of these repeaters, the signal is relayed to all other repeaters in the System and can be heard simultaneously up and down the country. For example, a station with a handheld in Wellington can talk via the System to a station in Auckland as if he or she were in the local region.

Guidelines for repeater use

Your local repeater will be monitored by more people than any simplex frequency, both by amateurs and non-amateurs. For many people it will be the only one they use—if it is occupied they will not be able to go to another one in the same way that another simplex channel can be used if one is busy. Therefore, extra courtesy and consideration for others is warranted.



Pay attention to good operating procedures—other listeners need to know what is going on. They will particularly want to know if a contact has been finished, so that they can use the repeater without worrying about getting in the way of someone else's conversation.

Keep in mind at all times why the repeater is there. In most cases, this will be voice communications. Non-voice modes on a voice repeater are not usual practice unless there are special circumstances—which usually means having discussed it previously with the repeater trustee. Digital modes (RTTY, AMTOR, Packet) are especially annoying to listen to and, of course, can't be deciphered without specialized equipment.

Voice on data repeaters (not digipeaters) is considered OK if that repeater is the only one you can use to make contact. It's probably best not to make the QSO any longer than absolutely necessary; you will no doubt reach this conclusion fairly rapidly yourself once the data starts coming in over the top of your transmissions!

One way use (ie, where one or more stations are not heard on the repeater output) is not advisable. A quick call to request another station to go to another frequency is OK, but it is inconsiderate and confusing to others to keep up a one-way contact for any length of time. Use simplex and a dummy load where possible for the alignment and preliminary testing of equipment. Avoid the use of repeater input frequencies for this purpose.

NZART co-ordinates the repeater system and will generally only accept proposals for repeaters that meet the guidelines commonly accepted in New Zealand. The FMTAG is responsible to NZART for the maintenance of repeater technical standards and recommended channel allocations. All repeater systems in New Zealand require a licence from the New Zealand Radio Frequency Service.

Bear in mind that all the comments above apply specifically to New Zealand repeaters and there may be marked differences in the operation of overseas repeaters and the procedures which you must use to work with them.

Amateur radio is "on display" on repeaters more than anywhere else. Try to create as good an impression as possible.

Phone patches

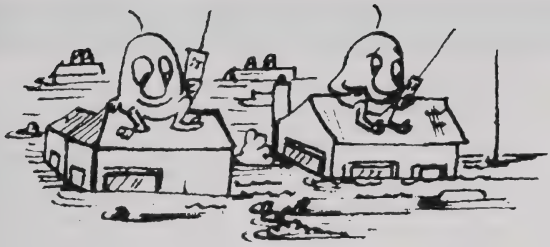
Radio regulations and licence requirements should be carefully observed when using a phone patch. Non-amateurs are not permitted to control an amateur station.

Normal traffic handled is "brief personal" messages, not business or commercial, and ONLY within New Zealand.

Phone patch equipment requires proper authorization to permit its connection to the public switched telephone network.

Packet radio

Messages sent via Packet radio should be in the spirit and tradition of amateur radio and meet the requirements of the Radio Regulations.



Care should be taken when distributing hardware, software or publications via Packet radio as it may be interpreted by others as advertising or infringing the copyright of material originated by others.

Priorities on repeaters

Repeaters allow mobile and portable stations away from the luxuries of mains power supplies and sophisticated antenna systems to increase their range. Another important purpose is to facilitate emergency communications.

Amateur Radio Emergency Corps (AREC) operators are distinguished by the use of E (emergency) call-signs, for instance ZL2EMA. If you hear these stations, give them priority.

Portable stations are those who are operating away from home, for example, a holidaymaker at a motor camp or a tramper in the ranges. They will identify themselves by using the word "portable" after the call-sign, eg: "This is ZL2QO portable listening seven-one-seven-five." If you hear these stations, give them priority—they may not have access to a telephone and could be needing to relay an urgent message.Mobile stations are actually on the move at the time of transmission. They may quite often be heard on their way to and from work at peak hours, and will identify themselves by saying: "This is ZL4HG mobile seven-ten." There are all sorts of variations on this basic theme, such as "pedestrian mobile" (on foot), "train mobile", "maritime mobile" (all at sea?) and even "stationary mobile"—surely a contradiction in terms if ever there was one! Mobile stations may need to report breakdowns, traffic delays, traffic accidents or other urgent/important pieces of information, so should be given priority if heard.

Usually a mobile or portable station will not hog the repeater but will be listening for other stations who may need to use the frequency. With a little give and take there is plenty of room for all.

STSP Repeater

(Short Term Special Purpose repeater). A repeater designed for emergency use or during special events. An example is perhaps the need to provide communication for some local public event. It's important to note that the frequencies that protected so that the repeaters can be moved about with little chance of interference with other repeaters.

The three second rule

Three seconds should be left between each over to allow other stations to access the repeater. If another station calls, let them in straight away—they may have an urgent message to transmit.

Long QSOs on repeaters

Lengthy conversations on repeaters need to be approached with care. It would not be very thoughtful to tie up a repeater for a long time during rush hour or early evening when other people are likely to be wanting to use it. Late at night is best. Where available, a 70 cm repeater that's not part of the National System might be a better choice if there is less traffic on that band and less likelihood of getting in someone else's way. Make sure that you leave three second gaps for other traffic, and it may also be a good idea to leave longer gaps, such as 10 seconds, every so often. Bear in mind, too, that even though you may make every effort to allow other stations to use the repeater if they need to, many people would rather wait until you have finished altogether. If possible, break the conversation up into two or three shorter contacts and leave the repeater free in between them.

More of a nuisance than long QSOs are long overs, especially when there are inadequate gaps between them. At busy times, keep the overs short so as to allow others, possibly with urgent messages, to access the repeater

Checking the repeater input signal

Most radios these days have a setting called "repeater reverse", "monitor" or something similar which allows the operator to check the repeater input signal, ie, the frequency the other station is actually transmitting on. If you can hear this signal, it is a good indication that simplex contact with the station is possible.

Using simplex

Home station to home station contacts should be made on simplex where possible, thus leaving the repeaters free to facilitate mobile and portable communication.

Simplex is like carrying on a conversation at the back of a room: although fewer people will hear it,

it is still not private. The same standards of language and content apply regardless of frequency.

There are eight designated FM simplex channels on both the 2 m and 70 cm bands. A list of simplex channels is given in this Call Book.

Channel terminology

Channels or frequencies that are used on VHF/UHF are not normally named by all the numbers that make up the frequency. Instead, it is more common to use an abbreviated form of frequency for convenience. For example, the common simplex frequency of 146.525 MHz is referred to as six-five-two-five, where the rule is to omit the first two digits and the decimal point. The exception to this rule is where the frequency ends in zero, in which case the zero is omitted. For example, the frequency 147.000 MHz is referred to as seven-hundred, not seven-thousand.

Simplex and repeater signal reports

Many transceivers incorporate a signal strength meter (often called an S-meter). When you are listening to a transmission on simplex, the S-meter reading will give you an indication of how strong the station's signal is. With a repeater, the situation is quite different. The repeater signal strength remains constant, regardless of the transmitting station's signal strength. The degree of signal *quieting* varies instead—a strong input signal produces a clear, noise-free repeater output—described as "fully quieting" or "fully limiting"—while a weak signal will be noisy. If a signal falls below a certain level, it will not hold the repeater reliably but will pulse it intermittently or drop out altogether.

Please remember that other stations rely on signal reports to determine how well their setup is working—try to make your signal reports as accurate as you can.

Other modes

FM is not the only mode used on VHF and UHF, in fact almost any mode can, and often is, used on these bands. For example, single-band (SSB) is used for weak signal and long-distance work towards the bottom end of the 2 m band. By contrast, CW or Morse is used for very exotic work such as earth-moon-earth (E-M-E) communication. As on all bands, you choose the mode that best suits your application and your desire for experimentation.

You should be aware that many of the conventions we have outlined above for repeater operation may not necessarily apply to some of these exotic modes. As an extreme case, in E-M-E operation contacts are highly structured, based on very severe time constraints. The precise procedures for all the modes are beyond the scope of this article. They are covered in the recommended references.

The 6 m band

The 6 m band (50–54 MHz), lying between the highest high-frequency band and the 2 m VHF band, provides some exciting scope for experimentation into unusual modes of radio propagation. Communications over several thousands of kilometres is possible under favourable conditions, while at other times the band can seem dead.

This bands lies close to the television Channel One, even overlaying part of this channel. For this reason a special MoC permit is required for operation in part of this band. You should consult a local Branch of NZART, FMTAG or known 6 m enthusiasts for details on the specific procedures before you begin operation.

Summary

Most of the special points relating to repeater use come under the category of commonsense considerations for others.

The Amateur's Code, first published in the *ARRL Handbook*, and reprinted in this Call Book, sums these up succinctly and we can do well to bear it in mind at all times.

LEARNING THE MORSE CODE

by GARY BOLD ZL1AN

Despite what the old-timers say, very few of us found learning Morse easy. To master Morse reception at 12 wpm requires an average of about 70 hours of study, but there are wide variations. About 10 per cent of learners do it in 40 hours or less, and another 10 per cent take more than 150 hours.

A lot depends on the way you learn. All authorities agree that the worst possible way to learn is by memorizing the code symbols from a printed chart. People who do this usually have little problem sending, but great trouble learning to receive. This is because they have to convert "visual" images into "sound" ones for every character they hear.

Learn to *receive* Morse first, and start by *listening* to it. The best way is to learn from a computer program which sends characters audibly, interrogates your state of knowledge, and adapts to your own rate of progress. Don't use programs which train you for the North American tests, which are different (simulated QSOs) from the New Zealand one (plain language). Don't use programs which exclusively send random groups. The skills involved in reading plain language text are different. Suitable software, for PC (IBM—compatible) computers only, is available from me (ZL1AN). Send a disk and SASE to the *Call Book* address.

Audio cassette tape systems are also available. The best ones start by sounding a character audibly, then giving its associated letter by voice. Later tapes send words, then sentences, at increasing speeds.

There are usually several Morse practice nets running during the week on 80 m. If you have an HF receiver, tune around 3.550 to 3.600 MHz, starting at about 1900 hours. These sessions are easy to recognize because after each code transmission, lasting a few minutes, the control station reads back the text and often invites comments from listeners. Speeds are varied, and texts are different each night. The discussion you'll hear are useful, since common problems are often discussed, and ways of overcoming them. If you can, spend some time just *listening* to the faster Morse sent between conversing Hams. You will pick out occasional letters, then whole words. It has been shown that this is very helpful as an adjunct to normal practice.

Several Branches also run practise sessions on VHF, or at the Clubrooms on a regular basis. Enquire at your local NZART Branch.

Learn the numbers at the same time as the letters—they are actually easier because they are longer—but many people put off learning them until the alphabet is mastered, and they seem harder because less time has been spent on them. I recommend learning the four common punctuation symbols (stop, comma, query and slash) and the "break" sign as well.

However you learn, listen *only* to Morse at a character rate of 12 wpm or more (I recommend 14 wpm), initially with long gaps between the characters. As you improve, the gap can be shortened until you are reading correct Morse. This helps progress considerably, since the mind does not have to adjust to a steadily increasing character speed, but has only to decrease recognition time.

The receiving test is a *written* one, so write the text down as you receive it. Many find it easier to print at first. Try to avoid *anticipating* the next character—if you get it wrong it will throw you off.

How long, and how frequently, should you practice? Half an hour per day is fine. Some people find that before breakfast, when the mind is fresh, is better than in the evening. Others find that two 20 minute sessions, morning and evening, work well for them. Longer than this, staleness sets in and little further progress is made. If you do this, in three to six months you'll almost certainly be up to 12 wpm. Some people get additional practice by listening to code tapes while driving to work, sweeping the basement, or doing the dishes.

This is where tooth-gritting dedication comes in. You have to practise *regularly*, and make it a part of your daily routine. If you stop for a month, you'll slip back. If you use tapes or a computer you can periodically compute your error rate at a given speed. Invariably those who do this find that they are improving—even though they feel that they are standing still.

Only after you have the correct *sound* and *rhythm* of the characters embedded in the mind should you commence sending practise. Good *new* Morse keys are hard to come by, but there are still some used ones about, and you may find that a local will loan or sell you one. Most New Zealanders find the rounded European knob easier to manipulate than the flat or slightly dished American one. Some have replaced flat knobs with pot lids from the hardware store.

Secure the key firmly near the edge of a table. I recommend opening the key contacts to give a throw of about 1 mm at the knob, and adjusting the tension until the key closes with the weight of 2 D-cells on top of the knob (although some experts dispute these settings). Sit so that your sending arm is at right angles to the body, elbow level with the wrist. Keep the elbows stationary. Place two fingers atop the knob, thumb at the side or underneath. Form both dots and dashes by *pumping the wrist* and *not* by pressing with the fingers. "Finger sending" tenses the whole arm, guarantees a later "choppy" style and is rapidly tiring.

To get the relative lengths of dits and dahs correct, practise by sending this continuous stream:

di di di di *dah* dah *di* di di di *dah* dah . . .

Tap your foot regularly on the accented symbols. The four dit and two dah segments should take exactly the same time (although dash and dot *sounds* have a 3:1 ratio, if you include the dot-space with each one, the ratio becomes 2:1). Do not try to *send fast*! Speed will come when you get the rhythm right. Twelve words per minute rapidly becomes an easy sending speed for almost everyone.

If you can, practise sending along with a tape or computer, from a known text, and try to send in synchronism with the code you hear. (This is surprisingly difficult, even many regular operators have trouble!) This helps getting the correct space lengths between characters and words. By far the greatest fault you'll hear on the air is characters and words run together! This happens when operators try to send faster than their digital dexterity allows.

Once you pass the test, try to have at least a few contacts on the air. You may find that you enjoy it. You'll rapidly begin to recognize the different Morse sent by straight keys, bugs and electronic keyers, and find that the regulars on 80 m become instantly recognizable by their "fists", which are as distinctive as voices. Many have found that in a surprisingly short time their reading ability has outstripped their maximum sending speed. These days many then start using an electronic keyer which, after some practice, enables them to send at least 50 per cent faster than they can on a straight key, with much less effort.

You'll find that DX contacts with foreign stations are easy in CW, since all know enough basic English to communicate, and many in poorer countries operate *only* on CW.

Good luck!

NZART

working for you—publications, videos, information

THE FIRST CW QSO

by GARY BOLD ZL1AN

If you've passed the plain language Morse test without doing much, or any, listening on the air (readily possible) listening to real CW conversations is initially a perplexing experience. It takes some time to get used to the conventions, the Q codes, the abbreviations, the HF noise, and the interference.

After a while, however, you'll realize that the first few overs are usually very stylized, especially between stations who have not made contact before. The "standard information" (name, QTH, signal report, maybe power, rig, antenna) is always exchanged in a similar manner, and critical bits are always repeated. Only after a couple of overs does the conversation become less formal—but even then most of us follow patterns.

How should you go about it? Here some suggestions.

For the first QSO, it's a good idea to *arrange* a contact with some local who will send good, slow Morse, and have a strong enough signal to overcome the noise—which is quite unsettling if you have been used to noise-free code sent in practice sessions. And when you make contact, practise by sending the standard information just the way you would to an unknown operator.

Assume that I have called you. Here is how the conversation might go. I have included the abbreviations you'll hear frequently, and which you'll need to become familiar with.

ZL1XYZ ZL1XYZ DE ZL1AN ZL1AN K

ZL1AN DE ZL1XYZ—GE OM ES TNX FER CALL—RST 589 589—NAME HR FRED FRED ES QTH AUCKLAND AUCKLAND HW? ZL1AN DE ZLXYZ K

ZL1XYZ DE ZL1AN—GE FRED—RST 579 579—NAME HR GARY GARY ES QTH AUCKLAND AUCKLAND HW? ZL1XYZ DE ZL1AN K

ZL1AN DE ZL1XYZ—R—FB GARY—WX HR TODAY FINE ES TEMP 23—RG HR TS440 RUNNING 100W—ANT IS DIPOLE AT 10 METRES—HW? ZL1AN DE ZL1XYZ K

ZL1XYZ DE ZL1AN—R—FB FRED—HR WX COLD BUT NO RAIN—RIG HR TS520S—RUNS 80W—ANT IS ONLY END FED RANDOM WIRE WITH TUNER HI-BAND GUD TONITE—NO QRN OR QRM—HW? ZLXYZ DE ZL1AN K

ZL1AN DE ZL1XYZ—R FB GARY—TNX FER QSO—NW CUL ES 73 GARY GN OM—ZL1AN DE ZL1XYZ SK

dit dit

dit dit

Now at 12 wpm those exchanges will have taken just over 10 minutes. That's plenty long enough for a start, so you can sign off gracefully. I guarantee you'll get a real buzz out of doing that!

Points to note

M Overs start and finish with the call-sign exchange, terminates with "K". Some operators insert "AR" before the last one, and finish with "KN"—which means "I don't want anybody to break-in". But most of us enjoy having others enter our conversations.

- We used the most common standard abbreviations GE, OM, ES, TNX, R FER, HR, HW, FB, WX, RIG, ANT, HI, W, GUD, NW, CUL, GN. "HI" is correctly sent as "HEE". If some of these are strange, look them up. They rapidly become intuitive, and really save time.
- We used the most common Q-code and procedural signs QTH, QRM, QRN, QSO, RST.
- We exchanged information in a very stylized manner. Between friends or inveterate ragchewers conversations will be less formal, especially after the first few overs—but you won't go wrong doing it just this way, and many DX conversations sound just like this.
- We each ended with a pleasant "dit dit" to say goodbye—not necessary, but you'll often hear it. (Sometimes after an interesting conversation several other "dit dits" will sound, from phantom listeners who have been following the conversation with interest.

To begin with, everybody finds it difficult to "send from the head" instead of reading from a text, as you will have been doing in practice. Therefore, *write down the first few overs you'll send*—at least in skeleton form, so you can send from the hard copy. You'll rapidly find that this becomes unnecessary.

You'll also probably find it more natural to initially write *everything received down*, as you will have been doing. With experience you'll begin to "read in the head" and note down only call-signs, times, reports, names and items to comment on. Experienced operators write up the log as they go, but at first it's much easier to scribble details down on a scratch pad and complete the log carefully afterwards.

If the conversation continues longer, what do you say? CW operators talk about almost everything. Make two more lists: one of short phrases about your job, your age, your family, your other hobbies, other modes you operate. The other, questions you can ask: what is *your* job? Do you operate Packet? How long have you been a ham? This may seem very stilted, but it will get you going. After a while these memory joggers won't be necessary either.

You will often hear stations calling "CQ"—more common on CW than SSB these days. At some stage you will want to send one yourself. The "3×3" format is best, that is:

CQ CQ CQ DE ZL1AN ZL1AN ZL1AN

repeated three times, terminated with "K". Don't be one of those irritating people who send "CQ CQ CQ ..." 25 times before giving a call-sign. Listeners get impatient and wander off. Short calls, repeated after a few seconds are best. If you call CQ, tune around a few kilohertz listening for answers, somebody may have forgetfully left his RIT engaged, and be replying outside your passband.

When 40 m and above are open, DX contacts are easy since ZL stations are held to be quite rare and everybody is happy to talk to us. Often you'll hear:

MY QSL SURE PS QSL VIA BURO

which means "I will certainly send you my QSL card, please send yours via the QSL bureau". Information regarding QSL Bureau procedure will be found elsewhere in the *Call Book*, and somebody at the local Branch will explain what to do.

If you answer a CQ the accepted polite thing to do is to send back at a speed no greater than that of the sending station—unless you know that the other operator is capable of higher speeds. If somebody answers you at a speed higher than you can comfortably receive, send back "PSE QRS 15"—or whatever speed you can copy. If the other station won't do this, just sign off gracefully and talk to somebody else. There are plenty of DX stations who send around this speed, and many, CQing faster, will gladly slow down to talk to you.

You will also hear conversations at higher speeds in the 20–30 wpm range. These operators generally use electronic keyers and send very good Morse. Listen to such contacts frequently and you'll find your reading speed slowly improves. Once you have the experience to operate in this range, you'll find contacts very enjoyable as a surprising amount of information can be passed at these speeds, and the Morse is better.

At higher speeds than these it becomes difficult for ordinary mortals to send accurately with any sort of keyer. You'll hear stations conversing at 35–45 wpm using keyboards for sending, although they will be reading in their heads. Once you can copy at these speeds, the Morse, being perfect, is a delight to copy—it just "decodes itself". Conversations at these speeds are typically much more in "plain language" with few abbreviations and included punctuation.

Come down and join the regulars on the bottom end of 80 metres! We'll be glad to talk to you!

The Amateur is Friendly ...

Slow and patient sending when requested, friendly advice and counsel to the beginner, kindly assistance, co-operation and consideration of the interests of others; these are the marks of the amateur spirit.

The Amateur's Code

ABBREVIATIONS FOR CW WORK

ABT	About
AGN	Again
ANT	Antenna
AR K	End of transmission
AR VA	Final end of transmission
AS	Wait
BCI	Broadcast interference
BCL	Broadcast listener
BK	Break; I wish to break-in (interrupt) a transmission in progress
BN	All between; been
BUG	Semi-automatic key
B4	Before
C	Yes
CL	I am closing my station; call
CPI, CPY	Copy
CQ	Calling any station
CUAGN	See you again
CUD	Could
CUL	See you later
CW	Continuous wave, i.e. radio telegraphy
DE	From
DR	Dear
DX	Distance, foreign countries
ER	Here
ES	And; &
FB	Fine business, excellent
FER	For
FM	Frequency modulation; From
GA	Go ahead, continue sending; good afternoon
GB	Goodbye
GE	Good evening
GG	Going; grounded grid
GM	Good morning
GN	Good night
GND	Ground
GUD	Good
HI	Laughter; High
HPE	Hope
HR	Here; Hear; Hour
HV; HVE	Have
HW	How
K	Go ahead
KN	specific station go ahead
MA; MILS	Milliamperes
MNI	Many
MSG	Message
N	No; North
NCS	Net control station
ND	Nothing doing
NIL	Nothing; I have nothing for you
NR	Number
NW	Now
OB	Old boy
OC	Old chap
OM	Old man
OP; OPR	Operator
OT	Old timer; Old top
PSE;	Please
PWR	Power
R	Received as transmitted; are (sometimes also used as a decimal point, e.g. 1R5)
RCVR; RX	Receiver
REF	Refer to; Referring to; Reference
RFI	Radio frequency interference
RIG	Station equipment
RPRT, REPT	Report
RPT	Repeat; I repeat
RTT; RTTY	Radioteletype
RX; RCVR	Receiver
SA	Say
SASE	Self-addressed, stamped envelope
SED	Said
SIG	Signal
SKED	Schedule
SRI	Sorry
SSB	Single sideband
SUM	Some
T	Zero (0)
THO	Though
THRU; THRO	Through
TMW	Tomorrow
TNX; TKS	Thanks
TT	That
TU; TKU	Thank you
TVI	Television interference
TX	Transmitter
TXT	Text
U	You
UR	Your; You are (sometimes YR)
URS	Yours (sometimes YRS)
VFO	Variable frequency oscillator
VY	Very
WID	With
WKD; WKG	Worked; Working
WL	Well; Will
WUD	Would
WX	Weather
XCVR	Transceiver
XMTR; TX	Transmitter
XTAL	Crystal
XYL; YF	Wife
YL	Young lady
73	Best Regards
88	Love and kisses

THE Q-CODE

QRG Will you tell me my exact frequency (or that of . . .)?
Your exact frequency (or that of . . .) is . . .kHz.

QRH Does my frequency vary?
Your frequency varies.

QRI How is the tone of my transmission?
The tone of your transmission is . . .
(1. Good; 2. Variable; 3. Bad)

QRK What is the intelligibility of my signals (or those of . . .)?
The intelligibility of your signals (or those of . . .) is . . .
(1. Bad; 2. Poor; 3. Fair; 4. Good; 5. Excellent)

QRL Are you busy?
I am busy (or I am busy with . . .) Please do not interfere.

QRM Is my transmission being interfered with?
Your transmission is being interfered with . . .
(1. Nil; 2. Slightly; 3. Moderately; 4. Severely; 5. Extremely)

QRN Are you troubled by static?
I am troubed by static . . .
(1–5 as under QRM)

QRO Shall I increase power?
Increase power.

QRP Shall I decrease power?
Decrease power.

QRQ Shall I send faster?
Send faster (. . . wpm).

QRS Shall I send more slowly?
Send more slowly (. . .wpm)

QRT Shall I stop sending?
Stop sending.

QRU Have you anything for me?
I have nothing for you.

QRV Are you ready?
I am ready.

QRW Shall I inform . . . that you are calling him on . . .kHz?
Please inform . . . that I am calling on . . .kHz.

QRX When will you call me again?
I will call you again at . . . hours (on . . .kHz).

QRZ Who is calling me?
You are being called by . . . (on . . .kHz)

QSA What is the strength of my signals (or those of . . .)?
The strength of your signals (or those of . . .) is . . .
(1. Scarcely perceptible; 2. Weak; 3. Fairly good; 4. Good; 5. Very good)

QSB Are my signals fading?
Your signals are fading.

QSD Are my signals mutilated?
Your signals are mutilated.

QSK Can you hear me between your signals and if so can I break in on your transmission?
I can hear you between my signals; break in on my transmission.

QSL Can you acknowledge receipt?
I am acknowledging receipt.

QSM Shall I repeat the last message I sent you, or some previous message?
Repeat the last message which you sent me [or message(s) number(s) . . .]

QSN Did you hear me (or . . .) on . . .kHz?
I did hear you (or . . .) on . . .kHz.

QSO Can you communicate with . . . direct or by relay?
I can communicate with . . . direct (or by relay through . . .)

QSP Will you relay to . . .?
I will relay to . . .

QST General call preceding a message addressed to all amateurs and ARRL members.

QSU Shall I send or reply on this frequency (or . . .kHz)?
Send or reply on this frequency (or . . .kHz).

QSV Shall I send a series of Vs on this frequency (or on . . .kHz)?
Send a series of Vs on this frequency (or on . . .kHz)

QSW Will you send on this frequency (or on . . .kHz)?
I am going to send on this frequency (or on . . .kHz)

QSX Will you listen to . . . on . . .kHz?
I am listing to . . . on . . .kHz.

QSY Shall I change to transmission on another frequency?
Change to transmission on another frequency (or on . . .kHz).

QSZ Shall I send each word or group more than once?
Send each word or group twice (or . . . times).

QTC How many messages have you to send?
I have . . . messages for you (or for . . .)

QTH What is your location?
My location is . . .
(QTHR—Location as per Call Book)

QTR What is the correct time?
The time is . . .

Morse Alphabet

A	• —	N	— •
B	— • • •	O	— — —
C	— • — •	P	• — — •
D	— • •	Q	— — • —
E	•	R	• — •
F	• • — •	S	• • •
G	— — •	T	—
H	• • • •	U	• • —
I	• •	V	• • • —
J	• — — —	W	• — —
K	— • —	X	— • • —
L	• — • •	Y	— • — —
M	— —	Z	— — • •

Numerals

1	• — — — —	6	— • • • •
2	• • — — —	7	— — • • •
3	• • • — —	8	— — — • •
4	• • • • —	9	— — — — •
5	• • • • •	0	— — — — —

Procedure Signals

Full stop	(.)	• — • — • —
Comma	(,)	— — • • — —
Colon	(:)	— — — • • •
Question mark/Repeat	(?)	• • — — • •
Apostrophe	(')	• — — — — •
Hyphen/dash	(-)	— • • • • —
Fraction bar	(/)	— • • — •
Parenthesis (left hand)	(( )	— • — — •
Parenthesis (right hand)	( ))	— • — — • —
Quotation marks	(")	• — • • — •
Error		• • • • • • • •

Spacing and length of signal

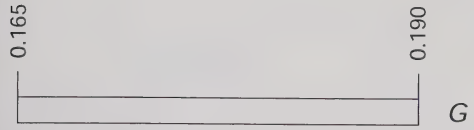
1. A dash is equal to three dots.
2. The space between the signals which form the same letter is equal to one dot.
3. The space between two letters is equal to three dots.
4. The space between two words is equal to seven dots.

WORLD TIME CONVERSION CHART IN HOURS

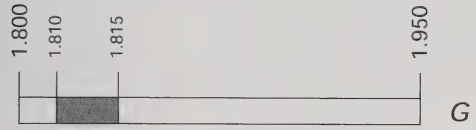
Greenwich Meridian Time, London, England	Central Europe, Berlin, Geneva, Stockholm, Vienna	Athens, Cape Town, Cairo	Arabia, Iraq, Eastern Europe, Moscow, Ethiopia, Malagasy	Mauritius, Oman, Reunion Island	Central Russia, Pakistan	Calcutta, Novosibirsk Russia, Bangladesh	Laos, Sumatra, Thailand	Philippine Islands Perth Australia	Central Australia, Tokyo Japan	Eastern Australia, Melbourne, Sydney	New Caledonia	International Date Line, Fiji Islands, New Zealand Standard Time	Nome, Alaska, Samoa, Midway Islands	Hawaiian Islands	Eastern Alaska, Dawson	Pacific Standard Time, Los Angeles, Seattle, Juneau	Mountain Standard Time, Calgary, Denver, Phoenix	Central Standard Time, Chicago, Costa Rica	Eastern Standard Time, Montreal, New York, Peru	Atlantic Standard Time, Chile, Nova Scotia	Greenland, Rio de Janiero, Brazil	Fernando de Horonha	Azores, Cape Verde
0000	1am	2am	3am	4am	5am	6am	7am	8am	9am	10am	11am	Noon	**1pm**	**2pm**	**3pm**	**4pm**	**5pm**	**6pm**	**7pm**	**8pm**	**9pm**	**10pm**	**11pm**
0100	2am	3am	4am	5am	6am	7am	8am	9am	10am	11am	Noon	**1pm**	**2pm**	**3pm**	**4pm**	**5pm**	**6pm**	**7pm**	**8pm**	**9pm**	**10pm**	**11pm**	Mid Night
0200	3am	4am	5am	6am	7am	8am	9am	10am	11am	Noon	**1pm**	**2pm**	**3pm**	**4pm**	**5pm**	**6pm**	**7pm**	**8pm**	**9pm**	**10pm**	**11pm**	Mid Night	1am
0300	4am	5am	6am	7am	8am	9am	10am	11am	Noon	**1pm**	**2pm**	**3pm**	**4pm**	**5pm**	**6pm**	**7pm**	**8pm**	**9pm**	**10pm**	**11pm**	Mid Night	1am	2am
0400	5am	6am	7am	8am	9am	10am	11am	Noon	**1pm**	**2pm**	**3pm**	**4pm**	**5pm**	**6pm**	**7pm**	**8pm**	**9pm**	**10pm**	**11pm**	Mid Night	1am	2am	3am
0500	6am	7am	8am	9am	10am	11am	Noon	**1pm**	**2pm**	**3pm**	**4pm**	**5pm**	**6pm**	**7pm**	**8pm**	**9pm**	**10pm**	**11pm**	Mid Night	1am	2am	3am	4am
0600	7am	8am	9am	10am	11am	Noon	**1pm**	**2pm**	**3pm**	**4pm**	**5pm**	**6pm**	**7pm**	**8pm**	**9pm**	**10pm**	**11pm**	Mid Night	1am	2am	3am	4am	5am
0700	8am	9am	10am	11am	Noon	**1pm**	**2pm**	**3pm**	**4pm**	**5pm**	**6pm**	**7pm**	**8pm**	**9pm**	**10pm**	**11pm**	Mid Night	1am	2am	3am	4am	5am	6am
0800	9am	10am	11am	Noon	**1pm**	**2pm**	**3pm**	**4pm**	**5pm**	**6pm**	**7pm**	**8pm**	**9pm**	**10pm**	**11pm**	Mid Night	1am	2am	3am	4am	5am	6am	7am
0900	10am	11am	Noon	**1pm**	**2pm**	**3pm**	**4pm**	**5pm**	**6pm**	**7pm**	**8pm**	**9pm**	**10pm**	**11pm**	Mid Night	1am	2am	3am	4am	5am	6am	7am	8am
1000	11am	Noon	**1pm**	**2pm**	**3pm**	**4pm**	**5pm**	**6pm**	**7pm**	**8pm**	**9pm**	**10pm**	**11pm**	Mid Night	1am	2am	3am	4am	5am	6am	7am	8am	9am
1100	Noon	**1pm**	**2pm**	**3pm**	**4pm**	**5pm**	**6pm**	**7pm**	**8pm**	**9pm**	**10pm**	**11pm**	Mid Night	1am	2am	3am	4am	5am	6am	7am	8am	9am	10am
1200	**1pm**	**2pm**	**3pm**	**4pm**	**5pm**	**6pm**	**7pm**	**8pm**	**9pm**	**10pm**	**11pm**	Mid Night	1am	2am	3am	4am	5am	6am	7am	8am	9am	10am	11am
1300	**2pm**	**3pm**	**4pm**	**5pm**	**6pm**	**7pm**	**8pm**	**9pm**	**10pm**	**11pm**	Mid Night	1am	2am	3am	4am	5am	6am	7am	8am	9am	10am	11am	Noon
1400	**3pm**	**4pm**	**5pm**	**6pm**	**7pm**	**8pm**	**9pm**	**10pm**	**11pm**	Mid Night	1am	2am	3am	4am	5am	6am	7am	8am	9am	10am	11am	Noon	**1pm**
1500	**4pm**	**5pm**	**6pm**	**7pm**	**8pm**	**9pm**	**10pm**	**11pm**	Mid Night	1am	2am	3am	4am	5am	6am	7am	8am	9am	10am	11am	Noon	**1pm**	**2pm**
1600	**5pm**	**6pm**	**7pm**	**8pm**	**9pm**	**10pm**	**11pm**	Mid Night	1am	2am	3am	4am	5am	6am	7am	8am	9am	10am	11am	Noon	**1pm**	**2pm**	**3pm**
1700	**6pm**	**7pm**	**8pm**	**9pm**	**10pm**	**11pm**	Mid Night	1am	2am	3am	4am	5am	6am	7am	8am	9am	10am	11am	Noon	**1pm**	**2pm**	**3pm**	**4pm**
1800	**7pm**	**8pm**	**9pm**	**10pm**	**11pm**	Mid Night	1am	2am	3am	4am	5am	6am	7am	8am	9am	10am	11am	Noon	**1pm**	**2pm**	**3pm**	**4pm**	**5pm**
1900	**8pm**	**9pm**	**10pm**	**11pm**	Mid Night	1am	2am	3am	4am	5am	6am	7am	8am	9am	10am	11am	Noon	**1pm**	**2pm**	**3pm**	**4pm**	**5pm**	**6pm**
2000	**9pm**	**10pm**	**11pm**	Mid Night	1am	2am	3am	4am	5am	6am	7am	8am	9am	10am	11am	Noon	**1pm**	**2pm**	**3pm**	**4pm**	**5pm**	**6pm**	**7pm**
2100	**10pm**	**11pm**	Mid Night	1am	2am	3am	4am	5am	6am	7am	8am	9am	10am	11am	Noon	**1pm**	**2pm**	**3pm**	**4pm**	**5pm**	**6pm**	**7pm**	**8pm**
2200	**11pm**	Mid Night	1am	2am	3am	4am	5am	6am	7am	8am	9am	10am	11am	Noon	**1pm**	**2pm**	**3pm**	**4pm**	**5pm**	**6pm**	**7pm**	**8pm**	**9pm**
2300	Mid Night	1am	2am	3am	4am	5am	6am	7am	8am	9am	10am	11am	Noon	**1pm**	**2pm**	**3pm**	**4pm**	**5pm**	**6pm**	**7pm**	**8pm**	**9pm**	**10pm**

AMATEUR RADIO BAND USAGE

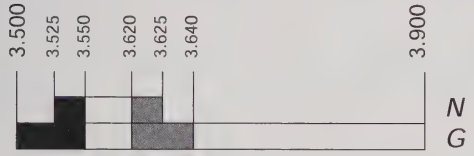
1800 metres
MOC permit required. Power limited to 5 W EIRP. See Break-In, December 1990 for details.



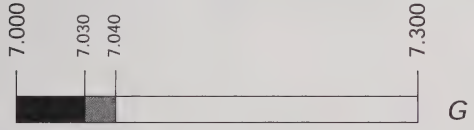
160 metres
Avoid 1.800 and 1.860 MHz. 1.850-1.950 MHz is shared with navigation.



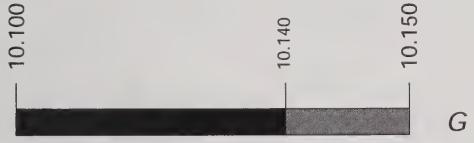
80 metres



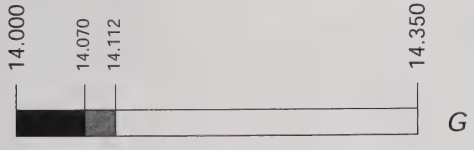
40 metres
Amateur satellite service permitted 7.0-7.1 MHz.



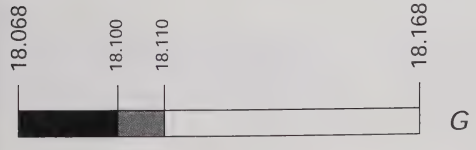
30 metres
Avoid 10.130 MHz ± 3 kHz.



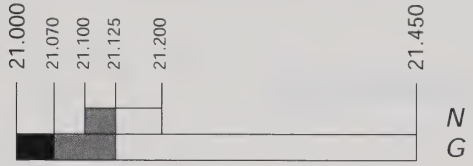
20 metres
Amateur satellite service permitted 14.00-14.25 MHz



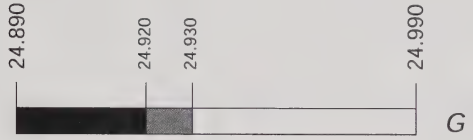
17 metres



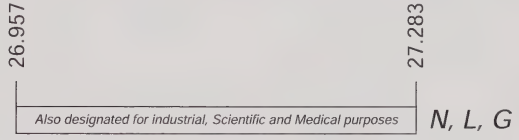
15 metres
Amateur satellite service permitted in whole band.



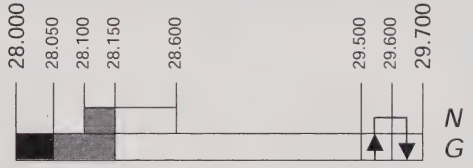
12 metres
Amateur satellite service permitted in whole band.



11 metres
Telemetry or telecontrol only, 5 W mean power maximum. Operation permitted by all licenced grades.



10 metres
Amateur satellite service permitted in whole band.



NOTE: This chart is taken from IARU Region 3 bandplans and should be taken as an operating guide. Always read this chart in conjunction with the table *Terms, Conditions and Restrictions Applying to Amateur Radio Apparatus Licence* from MED.

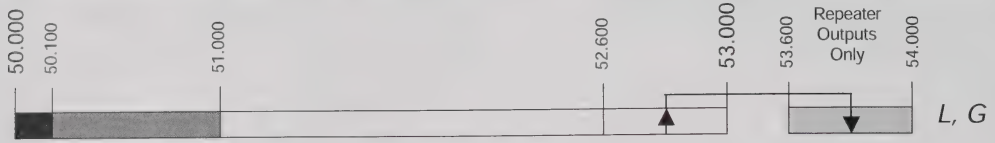
KEYS

▲ = Repeater input band segment 16 kHz bandwidth
▼ = Repeater output band segment 16 kHz bandwidth
■ = CW or modes less than 1 kHz bandwidth
□ = All modes with bandwidth less than 6 kHz
▒ = Data/packet, less than 6 kHz bandwidth
N = Novice, *L* = Limited, *G* = General class licence conditions apply
MED = Ministry of Economic Development

Prepared by FMTAG May 2000

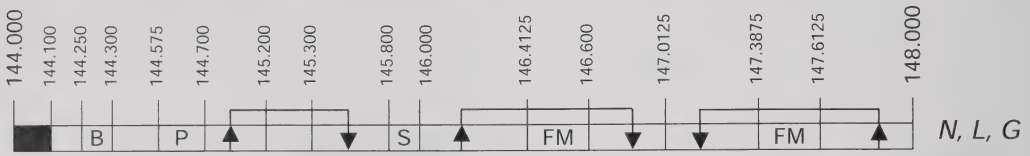
6 metres

Special conditions apply to the use of this band. Operation may require an MOC permit. Refer to *Terms, Conditions and Restrictions Applying to Amateur Radio Apparatus Licence* for more information. SSB/CW international calling 50.11 MHz, Oceania 52.05 MHz, FM calling 52.525 MHz. 53.6-54 MHz available for MOC approved fixed transmitters.



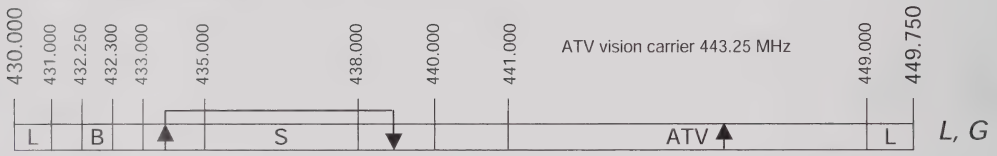
2 metres

Amateur satellite service permitted in the range 144-146 MHz. Oceania SSB calling 144.1 MHz, ZL calling 144.2 MHz, FM calling 144.5 and 146.475 MHz. Primary packet/digipeater 144.65 MHz, other frequencies available. Below 147 MHz, repeater offset -600 kHz, otherwise +600 kHz.



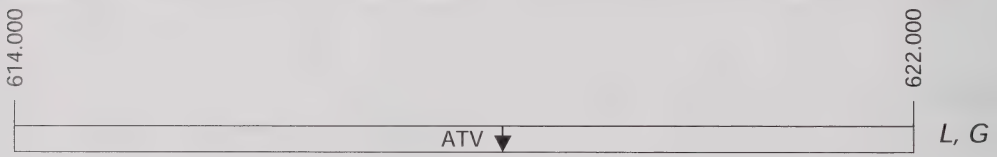
70 cm

Amateur satellite permitted in the range 435-438 MHz. SSB calling 432.2 MHz, FM calling 432.5 MHz, beacons 432.25-432.30 MHz. Primary packet/digipeater 432.65 MHz, other frequencies available. Repeater offsets -5 MHz in most cases, +5 MHz otherwise.



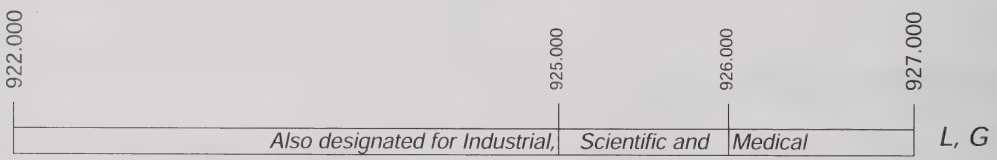
50 cm

SSB calling 621.2 MHz, FM calling 621.5 MHz, packet 621.65 MHz. ATV vision carrier 615.25 MHz ITU(R) system G.



32 cm

Power 25 W mean ERP. SSB calling 925.2 MHz, FM calling 925.5 MHz. Beacons 925.25-925.30 MHz.



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KEYS

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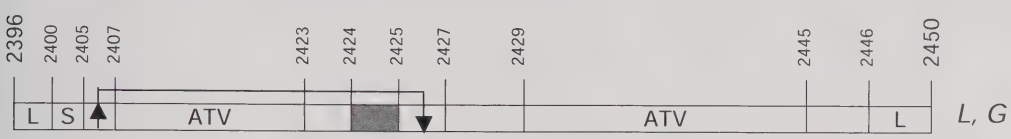
▼ = Repeater output band segment
■ = CW or modes less than 1 kHz bandwidth
□ = All modes
■ = Data/packet, less than 6 kHz bandwidth
□ = Repeater outputs only
N = Novice, *L* = Limited, *G* = General class licence conditions apply
MED = Ministry of Economic Development
ATV = Amateur Television, S = Satellites, B = Beacons, P = Packet, FM = FM simplex, L = Link
Narrow band segment bandplan for microwave bands detailed in *Simplex and Calling Frequencies*
Prepared by FMTAG May 2000

23 cm

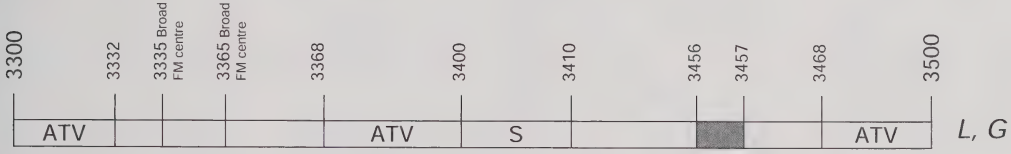
SSB calling 1296.2 MHz, FM calling 1296.5 MHz. Beacons 1296.25-1296.30 MHz. ATV video carriers 1241.25, 1249.25, 1275.25 and 1283.25 MHz ITU(R) system G. Repeater-20 MHz offset. Amateur satellite service in band 1260-1270 MHz, uplink only.

12 cm

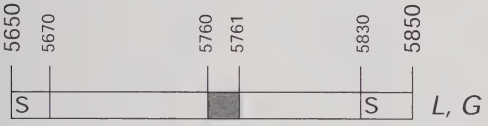
Standard 1 MHz narrow band segment 2424-2425 MHz. SSB calling 2424.2 MHz, FM calling 2424.5 MHz. Beacons 2424.25-2424.30 MHz. ATV in segments 2408-2422 and 2432-2446 MHz, ITU(R) system B. Repeaters -20 MHz offset. Amateur satellite service in 2400-2450 MHz, downlink.



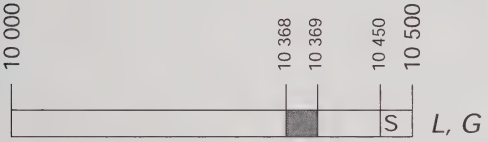
9 cm



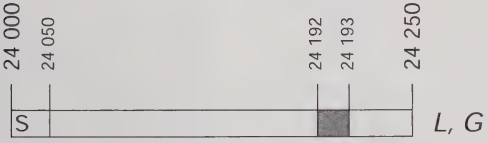
5 cm



3 cm

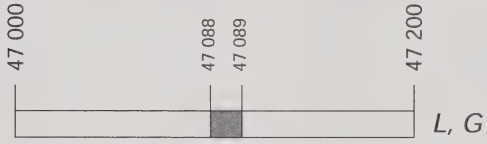


1.2 cm



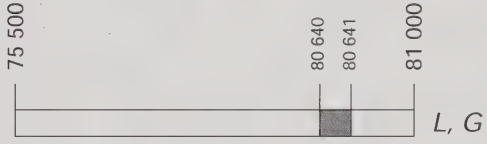
6 mm

Amateur satellite available on the entire band.



4 mm

Amateur satellite available on the entire band.



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▭ = All modes
▬ = Standard 1 MHz narrow band segment
L = Limited, *G* = General class licence conditions apply
MED = Ministry of Economic Development
ATV = Amateur Television, S = Satellites, L = Link
Narrow band segment bandplan for microwave bands detailed in *Simplex and Calling Frequencies*
Prepared by FMTAG May 2000

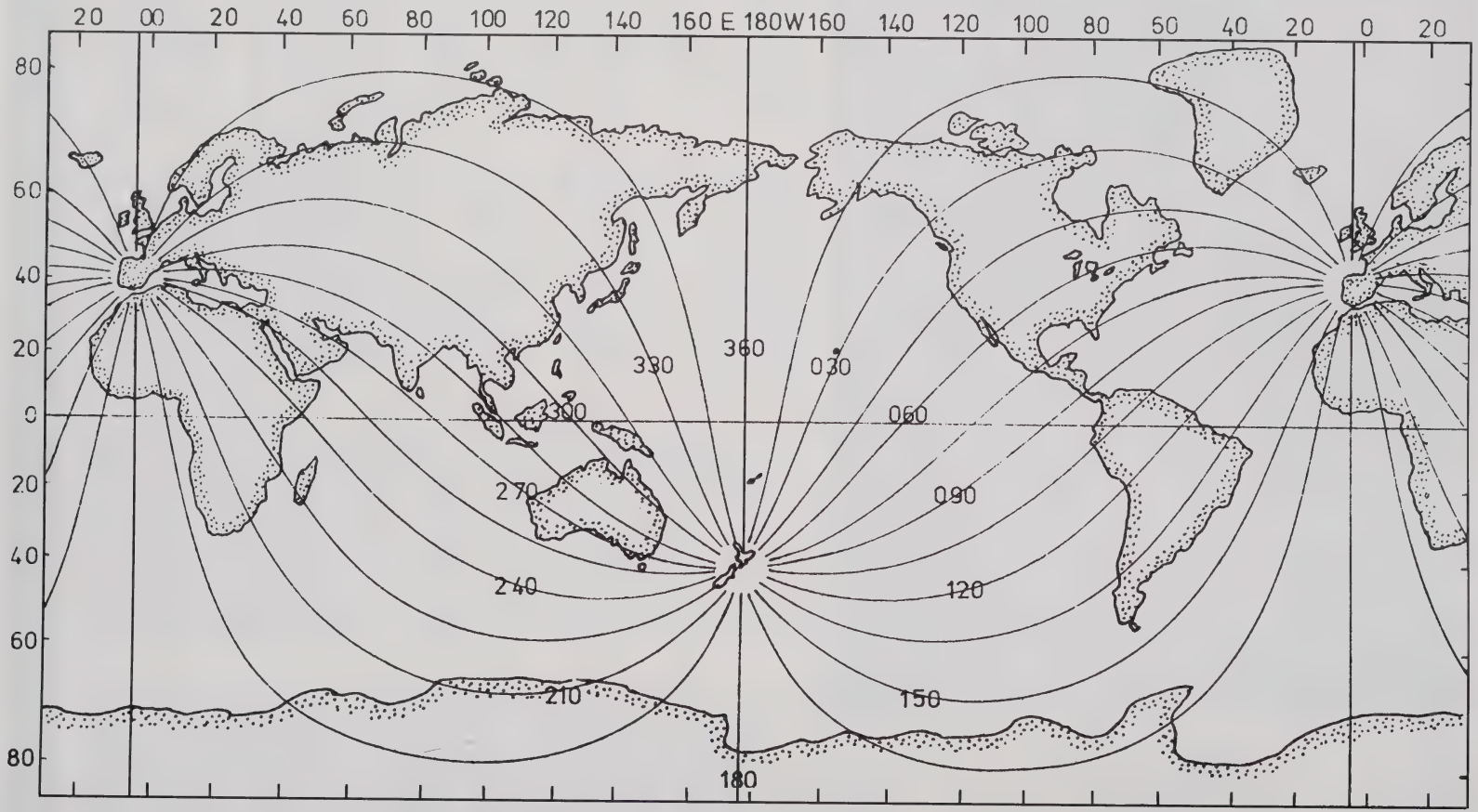
Great Circle DX Bearings Based on Wellington

prepared by RON MURPHY ZL1AMM

Listed below are the approximate short path bearings based on the great circle map centred on Wellington. These listings, based on true north, will point your directional antenna in the appropriate direction before final adjustment depending on the sharpness to which the antenna was installed. The long path bearings are about 180 degrees in the opposite direction.

A good inexpensive Azimuth (great circle on Wellington) map, number NZMS 47, is obtainable from metropolitan offices of the Department of Survey and Land Information. Available from overseas are several computer-derived DX beam headings.

A2	210	FJ, FS	100	KH2	320	S9	205	VU	270	3V	250
A3	20	FK	340	KH3	20	SM, SK, SL	330	VU7A	285	3W, XV	295
A4	270	FM	95	KH4	N	SP	310	VU7L	275	3X	155
A5	295	FO	60	KH5, KH5K	30	ST, STØ	250			3Y, Bouvet	185
A6	275	FP	65	KH6	25	SU	260	W, K, N, A	60	3Y, Peter I	155
A7	275	FR	235	KH7	N	SV, J4	270				
A9	275	FS	100	KH8	20			XE	70	4E7, DU	310
A, K, N, W	60	FT5W	220	KH9	350	T2	N	XF4	70	4J	330
AP	280	FT5X	225	KHØ	320	T3Ø	N	XT	180	4K2/FJL	N
		FT5Y	180	KL	15	T31	20	XU	295	4K5–9	290
BS7H, BSØH	290	FT5Z	230	KP1	90	T32	30	XV, 3W	295	4L	290
BV9P	310	FW	N	KP2	90	T33	N	XW	295	4KØ	330
BV, BO	315	FY	115	KP3, KP4	90	T5	245	XX	305	4S	280
BY, BA, BD, BG	315			KP5	90	T7	280	XY, XZ	290	4U/ITU	300
		G, GX	345	KX	350	T8	320			4U/UN	65
C2	N	GD, GT	5			T9	285	YA	290	4W	255
C3	280	GI, GN	15	LA	335	TA	280	YB, YC, YD	300	4X, 4Z	265
C5	155	GJ, GH	345	LU	135	TF	15	YI	270		
C6	95	GM, GS	N	LX	325	TG	90	YJ	330	5A	260
C9	230	GU, GP	345	LY	320	TI	90	YK	270	5B	270
CE	130	GW, GC	350	LZ	285	TI9	90	YL	320	5H	230
CEØ	110, 120					TJ	205	YN	90	5N	195
CO	80	H4	335	M, MX	345	TK	230	YO	285	5R	225
CN	220	HA	300	MD	5	TL	205	YS	90	5T	160
CP	125	HB	300	MI	15	TN	210	YU1, 6, 7, 8	285	5U	175
CT	130	HBØ	300	MJ	345	TR	200	YV	100	5V	175
CT3	140	HC	100	MM	N	TT	220	YVØ	100	5W	20
CU2, CT2	90	HC8	90	MU	345	TU	160			5X	235
CX	140	HH	90	MW	350	TY	190	ZA	275	5Z	235
CY9, Ø	65	HI	90			TZ	160	ZB	180		
		HK	100	N, K, W, A	60			ZC	270	6W	150
D2, 3	210	HKØ	90	OA	110	UA-UI, R	320	ZD7	180	6Y	90
D4	150	HL	325	OD	275	UJ-UM	290	ZD8	170		
D6	230	HP	90	OE	305	UN-UQ	290	ZD9	170	7O	255/275
DA to DR	320	HR	90	OH, OJ	330	UR-UZ, EM-EO	300	Z2	220	7P	220
DU, 4E7	310	HS, E2	285	OK, OL, OM	310			Z3	285	7Q	230
		HV	280	ON	330	V2	95	ZF	90	7X	240
E2, HS	285	HZ, 7Z	260	OX	20	V3	85	ZK1N	50	7Z, HZ	260
E3	245			OY	N	V4	95	ZK1S	60		
EA	260	I	280	OZ	330	V5	200	ZK2	N	8P	90
EA6	250	IS	270			V6	320	ZK3	30	8Q	275
EA8	140			P2	310	V7	350	ZL7	110	8R	110
EA9	180	J2	245	P4	95	V85	290	ZL8	30		
EI	10	J3	95	P5	325	VE	50	ZL9	190	9A	285
EK	290	J4, SV	270	PA	330	VK	280	ZP	125	9G	185
EL	180	J5	155	PJ	95	VK9C	270	ZS	210	9H	250
EM-EO, UR-UZ	300	J6	95	PJ7	90	VK9L	290	ZS8	210	9I, 9J	220
EP	280	J7	95	PY	140	VK9M	330			9K	270
ER	285	J8	95	PYØ	125, 145	VK9N	340	1AØ	280	9L	165
ES	320	JA	335	PZ	100	VK9W	320	1S	285	9M2, 4	285
ET, 9F	245	JD	335			VK9X	275			9M6, 8	285
EU, EV, EW	310	JT	325	RA	see UA	VKØH	220	3A	295	9N	295
EX	290	JW	5	R1A	180	VKØM	210	3B6	235	9Q	230
EY	290	JX	5	R1F	N	VP2	95	3B7	235	9U	230
EZ	290	JY	265	R1M	330	VP5	95	3B8	235	9V	285
						VP8	150, 180	3B9	230	9X	230
F	310	K, N, A, W	60	SØ	140	VP9	80	3C	205	9Y	100
FC	230	KC6	320	S2	290	VQ9	265	3CØ	205		
FG	100	KG4	90	S5	285	VR2, VS9	305	3D2	N		
FH	230	KH1	15	S7	240	VR6	90	3DAØ	220	Antarctica	180



GREAT CIRCLE BEARINGS FROM WELLINGTON.

Background

In circular G/6/96T of December 1996, Member Societies of IARU Region III were requested to note actions taken in the 1980s by IARU organisations to promote QRP communications; some of which include:

- Yearly QRP day observation on June 17.
- HF Contest QRP power level limit of 10 W input and QRPP power level 1 W input.
- All contest organisers to give consideration to include QRP categories.

Members are requested to take appropriate actions with reference to holding events, such as:

- QRP field Day.
- QRP Contest.
- Distribution of *QRP Transmitter Kits and Reference Book*.
- Workshop of QRP Operation.

The stated purpose of this is to contribute to more effective use of radio frequency spectrum.

The situation in New Zealand

Contests

A QRP Contest called the Sangster Shield, takes place as an annual event but is restricted to the CW mode of operation. It receives modest support and produces some outstanding performances.

There are QRP categories in many of the Contests to which New Zealand amateur operators are eligible contestants.

Local contests with a QRP category are better supported than those that have worldwide applicability. Perhaps this is because of the isolation of New Zealand and the distances that signals must travel, only to contend with high QRM levels and beam antennas faced away from the South Pacific.

These contests are an excellent way of testing QRP to the available limits.

For instance; the writer has used an American designed Argonaut 2 W transceiver in SSB mode on the 21 MHz band in the *CQ* WW Contest to good effect.

Workshop of QRP operation

In recent years, well-attended workshops and forums have been a feature of New Zealand Association of Radio Transmitters Conference.

Publication

- At one time QRP groups, notably in Christchurch and Wellington, contributed to a QRP edition of *Break-In*, the official magazine of NZART. As a consequence, members have subsequently been invited to conduct workshops at Branches.
- Changes in policy have made it difficult to produce a QRP edition.
- For several years Bill Cox ZL2BIL hosted a QRP chat page in *Break-In*. This provided a focal point for some and served as a reminder to others. Latterly the QRP page, when it appears, has had a more constructional emphasis.

Distribution of QRP Kits and Reference Books

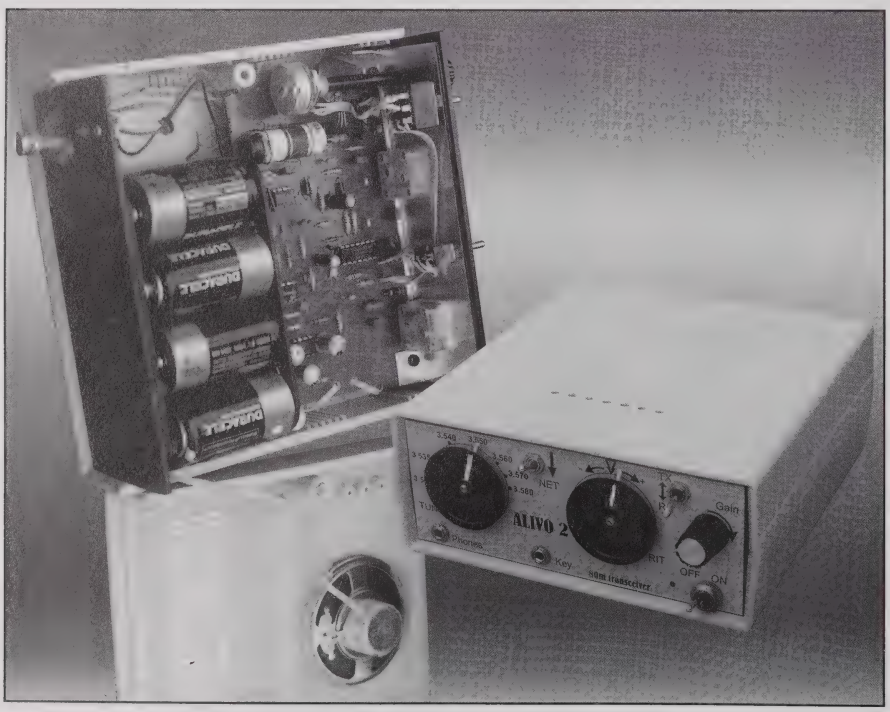
Break-In has been generous in the publication of construction articles and subsequent discussion papers.

A number of NZART Branches have distributed either full or partial kits; which are generally well received. For instance:

- The Chelmsford Transceiver which first appeared in the November 1983 Wellington Branch issue of *Break-In* has been purchased as a partial kit by one in every ten active amateur operators in New Zealand.
- In 1993 a replica of the Chelmsford was adopted as a home construction project in the USA.
- Various designs of QRP transmitting and receiving apparatus, e.g. from ARRL and DARC; have been adapted and printed circuit boards made available to New Zealand and occasionally Australian and Pacific Island amateurs.
- Kits for ancillary apparatus have been produced in profusion and one at least copied with minor amendment and put into commercial production in North America (a silent antenna matching tune-up bridge).
- Articles which first appeared in *Break-In* have been reproduced or reviewed in overseas amateur radio publications.

The benefits of QRP

- The future recruits of Amateur radio will come from achievers who enjoy the construction and subsequent adjustment and use of simple devices.
- The consequences of QRP are reduced levels QRM on the bands and less pollution of the ionosphere.
- QRP radio communications testify to the high constructional technique and operational abilities of many New Zealand radio amateurs.



ZL3KB's new PCB version of the ALIVO transceiver. (Photograph by ZL2KB.)

by
JOHN GABITES
ZL2AQ

Communication with neighbouring stations by *ground waves* is not affected by conditions in the upper atmosphere. In contrast all HF communications beyond, at the most, a few tens of kilometres depend on the presence of a layer of gasses so strongly ionized as to act as a reflector for *skywave* signals. These signals projected at the correct angle, will be directed down to the desired destination, either in one hop or by successive hops around the curvature of the earth.

The ionization of the atmospheric gasses is renewed each day by ultra-violet radiation from the sun. In the lowest layers (D and E) the density of ions decreases rapidly as the sun goes down, but in the higher F region the ionization lasts longer and diminishes slowly through the night. The strength of the ionizing radiation itself is liable to fluctuate from day to day and week to week. Observatories monitor the state of the ionosphere by sweeping through the HF spectrum with pulses directed vertically upward, timing the echoes to determine the virtual height of the reflecting layer, and noting the *critical penetration frequency* (f_0) above which reflections cease.

Radio waves impinging obliquely on the ionized layer can be reflected on higher frequencies that are related to f_0 by an *abliquity factor*. Thus, for example, with an F layer at 300 km, the required *radiation angle* above the horizon and the *maximum usable frequency* (MUF) for various distances would be:

0 km	90°	1.0(f_0)
500 km	48°	1.3(f_0)
1,000 km	28°	1.9(f_0)
2,000 km	14°	2.7(f_0)
3,000 km	4°	3.4(f_0)

Signals suffer power loss at every reflection and at every passage through the daytime D and E regions. The lower the frequency the more severe the loss—halving the frequency quadruples the loss. The lowest frequency to give a readable signal at the other end, in spite of losses, depends in part on the effective power radiated at the appropriate angle. Thus the *lowest usable frequency* (LUF) or *absorption-limited frequency* (ALF) is not a sharply defined limit applying to all stations like the MUF.

The IARU-NCDXF worldwide network of beacons in continuous operation on five amateur bands, and cycling through four power levels, provides a convenient means of sampling current propagation conditions to other parts of the world (see Figure 1). The full 18-beacon sequence on any band can be scanned in only three minutes.

For planning ahead it is usual to make use of predictions of the MUF and LUF based on the historical data provided by ionospheric observatories and averaged for different levels of solar activity. For a long time the main indicator of solar activity was the *sunspot number*, but the measurements of microwave radiation from the sun, begun at Ottawa in 1946, have proved more relevant to ionospheric conditions. The *solar flux index* is the measurement made at local noon (now at Penticton, British Colombia) on 2.8 GHz. This is not the ionizing radiation, but is something measurable at the ground that seems to vary in parallel with the ionizing radiations that maintain the ionosphere.

If an estimate can be made of the level of solar activity likely to apply at the time of interest, computers can sort through the world maps of averaged past data and extract the most probable MUFs at the required reflection points, at the relevant time, month and activity level. With considerable simplification, some very convenient programs have been produced for PCs. Most try to predict *median* values of MUF for a path, but to allow for the normal day-to-day variations of ionospheric conditions over a month many also indicate the expected *upper decile* (UD) value of MUF (likely to be exceeded on about 10 per cent of days) and the *lower decile* (LD) values (below which the MUF is likely to fall on the worst 10 per cent of days). Commercial stations normally set their frequencies some distance below the expected median MUFs to minimize the disruptions of schedules on "bad" days, and for this purpose often designate the LD as their *optimum working frequency* (OWF). This, however, is a compromise frequency—the *best propagation* is normally to be found just below the actual MUF at the time, which on a "good" day may be 15 per cent or more above the predicted median MUF. Although predictions of median MUFs such as those in *Break-In* may not always fit conditions on particular days very well, the predictions will still give useful indications of the best and worst times to try to communicate with distant places.

Most HF communications *within* New Zealand are by single-hop sky wave, requiring a medium to high take-off angle. Most amateur contacts need radiation angles above 40–45°, few need radiation below 30° to reach the remainder of the country. At the steep angles needed for nearby communications, signals on the higher frequency bands will penetrate the ionized layers and be lost to space, though lower-angled rays may still be reaching more distant stations. This *skip* over surrounding areas is most frequent and extensive when the ionization is weak, notably at night, in the winter, and in the years of low solar activity. Amateurs (including AREC) can usually keep nearby contacts on the 3.5 MHz band, while SAR and CD can change to their lower "night" frequencies. In contrast to local communications, *long distance* contacts are favoured by the lowest practicable radiation angles in order to maximuze the usable frequency, minimize the number of hops needed, and avoid unnecessary absorption losses.

Bursts of X-rays from *solar flares* can cause immediate intensifiction of ionization, notably in the D-region, over sunlit portions of the earth, causing sudden *shortwave fadeouts*. Clouds of charged particles ejected from the sun, and travelling more slowly, may be reported by satellite as a *satellite proton event* (SPE); they can interact with the earth's magnetic field, causing distortions of the field that are indicated by increases in the three-hourly geomagnetic K-index and the 24-hourly A-index, and themselves be deflected towards the magnetic poles to produce enhanced auroral displays, degraded radio propagation across the auroral zone, and perhaps severe *polar cap absorption* (PCA).

Summary

For long distance contacts use the lowest practicable radiation angle and the highest frequency usable at the time; listen to the beacons for an overview of propagation in different directions (and take great care not to transmit on the beacon frequencies!); listen to the hourly broadcasts from WWV or WWVH for the solar flux and K and A indices (and do not expect great propagation across the auroral regions if the geomagnetic field is disturbed); consult monthly predictions of median MUFs in *Break-In* or on PCs but be prepared for MUFs to be 15 per cent or more above the predicted medians on good days and 15 per cent or more below on bad days.

For domestic communications within New Zealand expect to do best with a medium to high radiation angle and a frequency low enough to avoid skip over the desired paths, but still use the highest band that is usable in order to minimize losses and multipath fading.

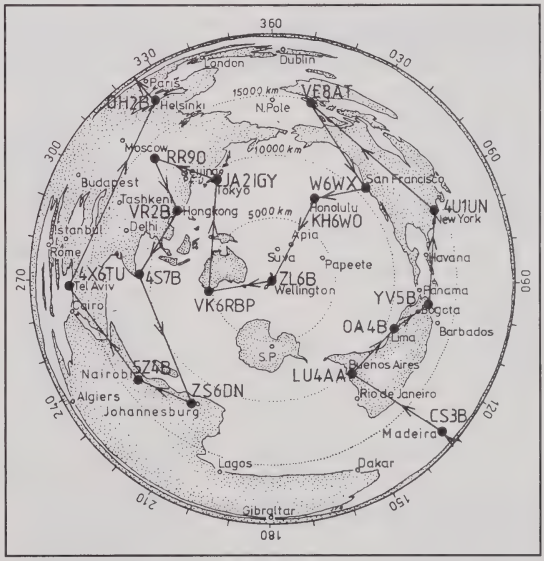


Figure 1. IARU-NCDXF Beacons. Continuous sequences on five bands: 14.100, 18.110, 21.150, 24.930 and 28.200 MHz. Each 10-second transmissions: call-sign, then four dashes on descending power (100 W, 10 W, 1 W, 0.1 W).

The Amateur is Considerate ...
never knowingly using the air in such a way at to lessen the pleasure of others.
The Amateur's Code

ALLOCATION OF INTERNATIONAL CALL-SIGNS

AAA-ALZ United States of America
AMA-AOZ Spain
APA-ASZ Pakistan
ATA-AWZ India
AXA-AXZ Australia
AYA-AZZ Argentina
A2A-A2Z Botswana
A3A-A3Z Tonga
A4A-A4Z Oman
A5A-A5Z Bhutan
A6A-A6Z United Arab Emirates
A7A-A7Z Qatar
A8A-A8Z Liberia
A9A-A9Z Bahrain

BAA-BZZ China

CAA-CEZ Chile
CFA-CKZ Canada
CLA-CMZ Cuba
CNA-CNZ Morocco
COA-COZ Cuba
CPA-CPZ Bolivia
CQA-CUZ Portugal
CVA-CXZ Uruguay
CYA-CZZ Canada
C2A-C2Z Nauru
C3A-C3Z Andorra
C4A-C4Z Cyprus
C5A-C5Z Gambia
C6A-C6Z Bahamas
C7A-C7Z World Met. Organisation
C8A-C9Z Mozambique

DAA-DRZ Germany
DSA-DTZ South Korea
DUA-DZZ Philippines
D2A-D3Z Angola
D4A-D4Z Cape Verde
D5A-D5Z Liberia
D6A-D6Z Comoros
D7A-D9Z South Korea

EAA-EHZ Spain
EIA-EJZ Ireland
EKA-EKZ Armenia
ELA-ELZ Liberia
EMA-EOZ Ukraine
EPA-EQZ Iran
ERA-ERZ Moldova
ESA-ESZ Estonia
ETA-ETZ Ethiopia
EUA-EWZ Belarus
EXA-EXZ Kyrgyz Republic
EYA-EYZ Tajikistan
EZA-EZZ Turkmenistan
E2A-E2Z Thailand
E3A-E3Z Eritrea
E4A-E4Z Palestinian Authority

FAA-FZZ France

GAA-GZZ United Kingdom

HAA-HAZ Hungary
HBA-HBZ Switzerland
HCA-HDZ Ecuador
HEA-HEZ Switzerland
HFA-HFZ Poland
HGA-HGZ Hungary
HHA-HHZ Haiti
HIA-HIZ Dominican Republic
HJA-HKZ Colombia
HLA-HLZ South Korea
HMA-HMZ North Korea
HNA-HNZ Iraq
HOA-HPZ Panama
HQA-HRZ Honduras
HSA-HSZ Thailand
HTA-HTZ Nicaragua
HUA-HUZ El Salvador
HVA-HVZ Vatican City
HWA-HYZ France
HZA-HZZ Saudi Arabia
H2A-H2Z Cyprus
H3A-H3Z Panama
H4A-H4Z Solomon Islands
H6A-H7Z Nicaragua
H8A-H9Z Panama

IAA-IZZ Italy

JAA-JSZ Japan
JTA-JVZ Mongolia
JWA-JXZ Norway
JYA-JYZ Jordan
JZA-JZZ Indonesia
J2A-J2Z Djibouti
J3A-J3Z Grenada
J4A-J4Z Greece
J5A-J5Z Guinea-Bisseau
J6A-J6Z Saint Lucia
J7A-J7Z Dominica
J8A-J8Z St. Vincent and Grenadines

KAA-KZZ United States of America

LAA-LNZ Norway
LOA-LWZ Argentina
LXA-LXZ Luxembourg
LYA-LYZ Lithuania
LZA-LZZ Bulgaria
L2A-L9Z Argentina

MAA-MZZ United Kingdom

NAA-NZZ United States of America

OAA-OCZ Peru
ODA-ODZ Lebanon
OEA-OEZ Austria
OFA-OJZ Finland
OKA-OLZ Czech Republic
OMA-OMZ Slovak Republic
ONA-OTZ Belgium
OUA-OZZ Denmark

PAA-PIZ Netherlands
PJA-PJZ Netherlands Antilles
PKA-POZ Indonesia
PPA-PYZ Brazil
PZA-PZZ Suriname
P2A-P2Z Papua New Guinea
P3A-P3Z Cyprus
P4A-P4Z Aruba
P5A-P9Z North Korea

RAA-RZZ Russian Federation

SAA-SMZ Sweden
SNA-SRZ Poland
SSA-SSM Egypt
SSN-STZ Sudan
SUA-SUZ Egypt
SVA-SZZ Greece
S2A-S3Z Bangladesh
S5A-S5Z Slovenia
S6A-S6Z Singapore
S7A-S7Z Seychelles
S8A-S8Z South Africa
S9A-S9Z Sao Tome and Principe

TAA-TCZ Turkey
TDA-TDZ Guatemala
TEA-TEZ Costa Rica
TFA-TFZ Iceland
TGA-TGZ Guatemala
THA-THZ France
TIA-TIZ Costa Rica
TJA-TJZ Cameroon
TKA-TKZ France
TLA-TLZ Central Africa
TMA-TMZ France
TNA-TNZ Congo
TOA-TQZ France
TRA-TRZ Gabon
TSA-TSZ Tunisia
TTA-TTZ Chad
TUA-TUZ Ivory Coast
TVA-TXZ France
TYA-TYZ Benin
TZA-TZZ Mali
T2A-T2Z Tuvalu
T3A-T3Z Kiribati
T4A-T4Z Cuba
T5A-T5Z Somalia
T6A-T6Z Afghanistan
T7A-T7Z San Marino
T8A-T8Z Palau
T9A-T9Z Bosnia and Herzegovina

UAA-UIZ Russian Federation
UJA-UMZ Uzbekistan
UNA-UQZ Kazakhstan
URA-UZZ Ukraine

VAA-VGZ Canada
VHA-VNZ Australia
VOA-VOZ Canada
VPA-VQZ United Kingdom
VRA-VRZ China/Hong Kong
VSA-VSZ United Kingdom
VTA-VWZ India
VXA-VYZ Canada
VZA-VZZ Australia
V2A-V2Z Antigua and Barbuda
V3A-V3Z Belize
V4A-V4Z Saint Kitts and Nevis
V5A-V5Z Namibia
V6A-V6Z Micronesia
V7A-V7Z Marshall Islands
V8A-V8Z Brunei Darussalam

WAA-WZZ United States of America

XAA-XIZ Mexico
XJA-XOZ Canada
XPA-XPZ Denmark
XQA-XRZ Chile
XSA-XSZ China
XTA-XTZ Burkina Faso
XUA-XUZ Cambodia
XVA-XVZ Vietnam
XWA-XWZ Laos
XXA-XXZ Portugal
XYA-XZZ Myanmar

YAA-YAZ Afghanistan
YBA-YHZ Indonesia
YIA-YIZ Iraq
YJA-YJZ Vanuatu
YKA-YKZ Syria
YLA-YLZ Latvia
YMA-YMZ Turkey
YNA-YNZ Nicaragua

YOA-YRZ Romania
YSA-YSZ El Salvador
YTA-YUZ Yugoslavia
YVA-YYZ Venezuela
YZA-YZZ Yugoslavia
Y2A-Y9Z Germany
ZAA-ZAZ Albania
ZBA-ZJZ United Kingdom
ZKA-ZMZ New Zealand
ZNA-ZOZ United Kingdom
ZPA-ZPZ Paraquay
ZQA-ZQZ United Kingdom
ZRA-ZUZ South Africa
ZVA-ZZZ Brazil
Z2A-Z2Z Zimbabwe
Z3A-Z3Z Macedonia

2AA-2ZZ United Kingdom

3AA-3AZ Monaco
3BA-3BZ Mauritius
3CA-3CZ Equatorial Guinea
3DA-3DM Swaziland
3DN-3DZ Fiji
3EA-3FZ Panama
3GA-3GZ Chile
3HA-3UZ China
3VA-3VZ Tunisia
3WA-3WZ Vietnam
3XA-3XZ Guinea
3YA-3YZ Norway
3ZA-3ZZ Poland

4AA-4CZ Mexico
4DA-4IZ Philippines
4JA-4KZ Azerbaijan
4LA-4LZ Georgia
4MA-4MZ Venezuela
4NA-4OZ Yugoslavia
4PA-4SZ Sri Lanka
4TA-4TZ Peru
4UA-4UZ United Nations
4VA-4VZ Haiti
4XA-4XZ Israel
4YA-4YZ Int Civil Aviation Organization
4ZA-4ZZ Israel

5AA-5AZ Libya
5BA-5BZ Cyprus
5CA-5GZ Morocco
5HA-5IZ Tanzania
5JA-5KZ Colombia
5LA-5MZ Liberia
5NA-5OZ Nigeria
5PA-5QZ Denmark
5RA-5SZ Madagascar
5TA-5TZ Mauritania
5UA-5UZ Niger
5VA-5VZ Togo
5WA-5WZ Western Samoa
5XA-5XZ Uganda
5YA-5ZZ Kenya

6AA-6BZ Egypt
6CA-6CZ Syria
6DA-6JZ Mexico
6KA-6NZ South Korea
6OA-6OZ Somalia
6PA-6SZ Pakistan
6TA-6UZ Sudan
6VA-6WZ Senegal
6XA-6XZ Madagascar
6YA-6YZ Jamaica
6ZA-6ZZ Liberia
7AA-7IZ Indonesia
7JA-7NZ Japan
7OA-7OZ Yemen
7PA-7PZ Lesotho
7QA-7QZ Malawi
7RA-7RZ Algeria
7SA-7SZ Sweden
7TA-7YZ Algeria
7ZA-7ZZ Saudi Arabia

8AA-8IZ Indonesia
8JA-8NZ Japan
8OA-8OZ Botswana
8PA-8PZ Barbados
8QA-8QZ Maldives
8RA-8RZ Guyana
8SA-8SZ Sweden
8TA-8YZ India
8ZA-8ZZ Saudi Arabia

9AA-9AZ Croatia
9BA-9DZ Iran
9EA-9FZ Ethiopia
9GA-9GZ Ghana
9HA-9HZ Malta
9IA-9JZ Zambia
9KA-9KZ Kuwait
9LA-9LZ Sierra Leone
9MA-9MZ Malaysia
9NA-9NZ Nepal
9OA-9TZ Congo
9UA-9UZ Burundi
9VA-9VZ Singapore
9WA-9WZ Malaysia
9XA-9XZ Rwanda
9YA-9ZZ Trinidad and Tobago

THE PHONETIC ALPHABET

The Phonetic Alphabet should be used with considerable discretion. Its primary purpose is to obviate confusion between letters and figures which have similar sounds, e.g.: BCDEGPTV, AKJ, MN, QU, FS, TWO, THREE, FIVE, NINE.

The possibility of confusion increases greatly under adverse operating conditions such as adjacent channel interference, high level of acoustic and electrical background noise, poor audio quality (including inferior articulation), fading, etc. Under these conditions more frequent use of the phonetic code may be necessary. However, when there is a complete absence of interference of any kind and signals are perfectly readable, phonetics can be eliminated except for difficult place names, proper names, and unusual words. Regardless of the quality of the circuit phonetics should always be used for call-signs during the establishment of initial contact. It is important to memorize the code thoroughly and to avoid using substitute words.

Phonetic Alphabet

Some words are likely to be misunderstood when passed over radio telephone circuits, due to phonetic similarity. A number of phonetic alphabets have been introduced to overcome this. The following being the most generally accepted at the present time.

A	ALFA	AL fah	P	PAPA	pah PAH
B	BRAVO	BRAH voh	Q	QUEBEC	Kwee BECK or
C	CHARLIE	CHAR lee		Key BECK	
D	DELTA	DELL tah	R	ROMEO	ROW me oh
E	ECHO	ECK oh	S	SIERRA	See AIR rah
F	FOXTROT	FOKS trot	T	TANGO	TANG go
G	GOLF	GOLF	U	UNIFORM	YOU nee form or
H	HOTEL	hoh TELL		OO nee form	
I	INDIA	IN dee ah	V	VICTOR	VIK tor
J	JULIET	JEW lee ETT	W	WHISKEY	WISS key
K	KILO	KEY loh	X	X-RAY	ECKS ray
L	LIMA	LEE mah	Y	YANKEE	YANG kee
M	MIKE	MIKE	Z	ZULU	ZOO loo
N	NOVEMBER	no VEM ber			
O	OSCAR	OSS cah			

1 WUN	2 TOO	3 thuh-REE	4 FO-wer	5 FI-yiv
6 SIX	7 seVEN	8 AIT	9 NI-ner	0 ZERO

DX CENTURY CLUB COUNTRIES LIST

Current Countries Total 332—Revised October 1999—Reproduced courtesy ARRL

Prefix	Entity	Continent	ZONE ITU	ZONE CQ
1S	Spratly Is.	AS	50	26
1A0	Sov. Mil. Order of Malta	EU	28	15
3A	Monaco	EU	27	14
3B6	Agalega & St. Brandon	AF	53	39
3B8	Mauritius	AF	53	39
3B9	Rodrigues I.	AF	53	39
3C	Equatorial Guinea	AF	47	36
3C0	Pagalu I.	AF	52	36
3D2	Fiji	OC	56	32
3D2	Conway Reef	OC	56	32
3D2	Rotuma I.	OC	56	32
3DA	Swaziland	AF	57	38
3V	Tunisia	AF	37	33
3W, XV	Vietnam	AS	49	26
3X	Guinea	AF	46	35
3Y	Bouvet	AF	67	38
3Y	Peter I I.	AN	72	12
4J,4K	Azerbaijan	AS	29	21
4L	Georgia	AS	29	21
4P-4S	Sri Lanka	AS	41	22
4U-ITU	ITU HQ	EU	28	14
4U-N	United Nations HQ	NA	08	05
4X, 4Z	Israel	AS	39	20
5A	Libya	AF	38	34
5B	Cyprus	AS	39	20
5H-5I	Tanzania	AF	53	37
5N-5O	Nigeria	AF	46	35
5R-5S	Madagascar	AF	53	39
5T[2]	Mauritania	AF	46	35
5U[3]	Niger	AF	46	35
5V	Togo	AF	46	35
5W	Samoa	OC	62	32
5X	Uganda	AF	48	37
5Y-5Z	Kenya	AF	48	37
6V-6W[4]	Senegal	AF	46	35
6Y	Jamaica	NA	11	08
7O[5]	Yemen	AS	39	21
7P	Lesotho	AF	57	38
7Q	Malawi	AF	53	37
7T-7Y	Algeria	AF	37	33
8P	Barbados	NA	11	08
8Q	Maldives	AS/AF	41	22
8R	Guyana	SA	12	09
9A[6]	Croatia	EU	28	15
9G[7]	Ghana	AF	46	35
9H	Malta	EU	28	15
9I-9J	Zambia	AF	53	36
9K	Kuwait	AS	39	21
9L	Sierra Leone	AF	46	35
9M2, 4[8]	West Malaysia	AS	54	28
9M6, 8[8]	East Malaysia	OC	54	28
9N	Nepal	AS	42	22
9Q-9T	Dem. Rep. of Congo	AF	52	36
9U[9]	Burundi	AF	52	36
9V[10]	Singapore	AS	54	28
9X[9]	Rwanda	AF	52	36
9Y-9Z	Trinidad & Tobago	SA	11	09
A2	Botswana	AF	57	38
A3	Tonga	OC	62	32
A4	Oman	AS	39	21
A5	Bhutan	AS	41	22
A6	United Arab Emirates	AS	39	21
A7	Qatar	AS	39	21
A9	Bahrain	AS	39	21

Prefix	Entity	Continent	ZONE ITU	ZONE CQ
AP-AS	Pakistan	AS	41	21
BS7[11]	Scarborough Reef	AS	50	27
BV	Taiwan	AS	44	24
BV9P[12]	Pratas	AS	44	24
BY ,BT	China	AS	(A) 23,24	
C2	Nauru	OC	65	31
C3	Andorra	EU	27	14
C5	The Gambia	AF	46	35
C6	Bahamas	NA	11	08
C8-9	Mozambique	AF	53	37
CA-CE	Chile	SA	14,16	12
CE0	Easter I.	SA	63	12
CE0	Juan Fernandez Is.	SA	14	12
CE0	San Felix & San Ambrosio	SA	14	12
CE9/KC4	Antarctica	AN	(B)	(C)
CM, CO	Cuba	NA	11	08
CN	Morocco	AF	37	33
CP	Bolivia	SA	12,14	10
CT	Portugal	EU	37	14
CT3	Madeira Is.	AF	36	33
CU	Azores	EU	36	14
CV-CX	Uruguay	SA	14	13
CY0	Sable I.	NA	09	05
CY9	St. Paul I.	NA	09	05
D2-3	Angola	AF	52	36
D4	Cape Verde	AF	46	35
D6[13]	Comoros	AF	53	39
DA-DL[14]	Fed. Rep. of Germany	EU	28	14
DU-DZ	Philippines	OC	50	27
E3[15]	Eritrea	AF	48	37
E4[43]	Palestine	AS	39	20
EA-EH	Spain	EU	37	14
EA6-EH6	Balearic Is.	EU	37	14
EA8-EH8	Canary Is.	AF	36	33
EA9-EH9	Ceuta & Melilla	AF	37	33
EI-EJ	Ireland	EU	27	14
EK	Armenia	AS	29	21
EL	Liberia	AF	46	35
EP-EQ	Iran	AS	40	21
ER	Moldovia	EU	29	16
ES	Estonia	EU	29	15
ET	Ethiopia	AF	48	37
EU, EV, EW	Belarus	EU	29	16
EX	Kyrgystan	AS	30,31	17
EY	Tajikistan	AS	30	17
EZ	Turkmenistan	AS	30	17
F	France	EU	27	14
FG	Guadeloupe	NA	11	08
FJ, FS[1]	Saint Martin	NA	11	08
FH[13]	Mayotte	AF	53	39
FK	New Caledonia	OC	56	32
FM	Martinique	NA	11	08
FO[16]	Austral I.	OC	63	32
FO	Clipperton I.	NA	10	07
FO	French Polynesia	OC	63	32
FO[16]	Marquesas I.	OC	63	31
FP	St. Pierre & Miquelon	NA	09	05
FR/G[17]	Glorioso Is.	AF	53	39
FR/J, E[17]	Juan de Nova, Europa	AF	53	39
FR	Reunion	AF	53	39
FR/T	Tromelin I.	AF	53	39
FT8W	Crozet I.	AF	68	39
FT8X	Kerguelen Is.	AF	68	39
FT8Z	Amsterdam & St. Paul Is.	AF	68	39

Prefix	Entity	Conti-nent	ZONE ITU	ZONE CQ
FW	Wallis & Futuna Is.	OC	62	32
FY	French Guiana	SA	12	09
G, GX	England	EU	27	14
GD, G	Isle of Man	EU	27	14
GI, GN	Northern Ireland	EU	27	14
GJ, GH	Jersey	EU	27	14
GM, GS	Scotland	EU	27	14
GU, GP	Guernsey	EU	27	14
GW, GC	Wales	EU	27	14
H4	Solomon Is.	OC	51	28
H40[18]	Temotu Province	OC	51	32
HA, HG	Hungary	EU	28	15
HB	Switzerland	EU	28	14
HB	Liechtenstein	EU	28	14
HC-HD	Ecuador	SA	12	10
HC8-HD8	Galapagos Is.	SA	12	10
HH	Haiti	NA	11	08
HI	Dominican Republic	NA	11	08
HJ-HK	Colombia	SA	12	09
HK0	Malpelo I.	SA	12	09
HK0	San Andres & Providencia	NA	11	07
HL	South Korea	AS	44	25
HO-HP	Panama	NA	11	07
HQ-HR	Honduras	NA	11	07
HS, E2	Thailand	AS	49	26
HV	Vatican	EU	28	15
HZ	Saudi Arabia	AS	39	21
I	Italy	EU	28,	15,33
IS, IM	Sardinia	EU	28	15
J2	Djibouti	AF	48	37
J3	Grenada	NA	11	08
J5	Guinea-Bissau	AF	46	35
J6	St. Lucia	NA	11	08
J7	Dominica	NA	11	08
J8	St. Vincent	NA	11	08
JA-JS	Japan	AS	45	25
JD1[19]	Minami Torishima	OC	90	27
JD1[20]	Ogasawara	AS	45	27
JT-JV	Mongolia	AS	32,33	23
JW	Svalbard	EU	18	40
JX	Jan Mayen	EU	18	40
JY	Jordan	AS	39	20
K,W,N,	United States of America	NA	6,7,8	3,4,5
AA-AK KC6, T8[21]	Palau	OC	64	27
KG4	Guantanamo Bay	NA	11	08
KH0	Mariana Is.	OC	64	27
KH1	Baker & Howland Is.	OC	61	31
KH2	Guam	OC	64	27
KH3	Johnston I.	OC	61	31
KH4	Midway I.	OC	61	31
KH5	Palmyra & Jarvis Is.	OC	61,62	31
KH5K	Kingman Reef	OC	61	31
KH6,7	Hawaii	OC	61	31
KH7K	Kure I.	OC	61	31
KH8	American Samoa	OC	62	32
KH9	Wake I.	OC	65	31
KL7	Alaska	NA	1,2	1
KP1	Navassa I.	NA	11	08
KP2	Virgin Is.	NA	11	08
KP3,4	Puerto Rico	NA	11	08
KP5[22]	Desecheo I.	NA	11	08
LA-LN	Norway	EU	18	14
LO-LW	Argentina	SA	14,16	13
LX	Luxembourg	EU	27	14
LY	Lithuania	EU	29	15
LZ	Bulgaria	EU	28	20
OA-OC	Peru	SA	12	10
OD	Lebanon	AS	39	20

Prefix	Entity	Conti-nent	ZONE ITU	ZONE CQ
OE	Austria	EU	28	15
OF-OI	Finland	EU	18	15
OH0	Aland Is.	EU	18	15
OJ0, OH0M	Market Reef	EU	18	15
OK-OL[23]	Czech Republic	EU	28	15
OM(23)	Slovak Republic	EU	28	15
ON-OT	Belgium	EU	27	14
OX	Greenland	NA	5,75	40
OY	Faroe Is.	EU	18	14
OZ	Denmark	EU	18	14
P2[24]	Papua New Guinea	OC	51	28
P4[25]	Aruba	SA	11	09
P5[26]	North Korea	AS	44	25
PA-PI	Netherlands	EU	27	14
PJ2, 4, 9	Bonaire, Curaçao (Neth. Antilles)	SA	11	09
PJ5-8	St.Maarten,Saba,			
St. Eustatius	NA	11	08	
PP-PY	Brazil	SA	(D)	11
PP0-PY0F	Fernando de Noronha	SA	13	11
PP0-PY0S	St. Peter & St. Paul Rocks	SA	13	11
PP0-PY0T	Trindade & Martim Vaz Is.	SA	15	11
PZ	Suriname	SA	12	09
R1FJ	Franz Josef Land	EU	75	40
R1MV	Malyj Vysotskij I.	EU	29	16
S0[1],[27]	Western Sahara	AF	46	33
S2	Bangladesh	AS	41	22
S5, YU3[6]	Slovenia	EU	28	15
S7	Seychelles	AF	53	39
S9	Sao Tome & Principe	AF	47	36
SA-SM	Sweden	EU	18	14
SN-SR	Poland	EU	28	15
ST	Sudan	AF	47,48	34
SU	Egypt	AF	38	34
SV-SZ	Greece	EU	28	20
SV/A	Mount Athos	EU	28	20
SV5	Dodecanese	EU	28	20
SV9	Crete	EU	28	20
T2[28]	Tuvalu	OC	65	31
T30	W. Kiribati (Gilbert Is.)	OC	65	31
T31	C. Kiribati (Brit. Phoenix Is.)	OC	62	31
T32	E. Kiribati (Line Is.)	OC	61,63	31
T33	Banaba I. (Ocean I.)	OC	65	31
T5	Somalia	AF	48	37
T7	San Marino	EU	28	15
T9[29]	Bosnia-Herzegovina	EU	28	15
TA-TC	Turkey	EU/AS	39	20
TF	Iceland	EU	17	40
TG, TD	Guatemala	NA	11	07
TI, TE	Costa Rica	NA	11	07
TI9	Cocos I.	NA	11	07
TJ	Cameroon	AF	47	36
TK	Corsica	EU	28	15
TL[30]	Central Africa	AF	47	36
TN[31]	Congo	AF	52	36
TR[32]	Gabon	AF	52	36
TT[33]	Chad	AF	47	36
TU[34]	Cote d'Ivoire	AF	46	35
TY[35]	Benin	AF	46	35
TZ[36]	Mali	AF	46	35
UA-UI1, 3, 4, 6, RA-RZ	European Russia	EU	(E)	16
UA2	Kaliningrad	EU	29	15
UA-UI8,9,0 RA-RZ	Asiatic Russia	AS	(F)	(G)
UJ-UM	Uzbekistan	AS	30	17
UN-UQ	Kazakhstan	AS	29-31	17
UR-UZ, EM-EO	Ukraine	EU	29	16
V2	Antigua & Barbuda	NA	11	08
V3	Belize	NA	11	07
V4[37]	St.Kitts & Nevis	NA	11	08

Prefix	Entity	Continent	ZONE ITU	ZONE CQ
V5	Namibia	AF	57	38
V6[38]	Micronesia	OC	65	27
V7	Marshall Is.	OC	65	31
V8	Brunei	OC	54	28
VE, VO, VY	Canada	NA	(H)	1–5
VK	Australia	OC	(I)	29,30
VK0	Heard I.	AF	68	39
VK0	Macquarie I.	OC	60	30
VK9C	Cocos-Keeling Is.	OC	54	29
VK9L	Lord Howe I.	OC	60	30
VK9M	Mellish Reef	OC	56	30
VK9N	Norfolk I.	OC	60	32
VK9W	Willis I.	OC	55	30
VK9X	Christmas I.	OC	54	29
VP2E[37]	Anguilla	NA	11	08
VP2M[37]	Montserrat	NA	11	08
VP2V[37]	British Virgin Is.	NA	11	08
VP5	Turks & Caicos Is.	NA	11	08
VP6	Pitcairn I.	OC	63	32
VP8	Falkland Is.	SA	16	13
VP8, LU	South Georgia I.	SA	73	13
VP8, LU	South Orkney Is.	SA	73	13
VP8, LU	South Sandwich Is.	SA	73	13
VP8, LU, CE9, HF0, 4K1	South Shetland Is.	SA	73	13
VP9	Bermuda	NA	11	05
VQ9	Chagos Is.	AF	41	39
VS6, VR2	Hong Kong	AS	44	24
VU	India	AS	41	22
VU	Andaman & Nicobar Is.	AS	49	26
VU	Laccadive Is.	AS	41	22
XA-XI	Mexico	NA	10	06
XA4-XI4	Revilla Gigedo	NA	10	06
XT[39]	Burkina Faso	AF	46	35
XU	Cambodia	AS	49	26
XW	Laos	AS	49	26
XX9	Macao	AS	44	24
XY-XZ	Myanmar	AS	49	26
YA	Afghanistan	AS	40	21
YB-YH[40]	Indonesia	OC	51,54	28
YI	Iraq	AS	39	21
YJ	Vanuatu	OC	56	32
YK	Syria	AS	39	20
YL	Latvia	EU	29	15
YN	Nicaragua	NA	11	07
YO-YR	Romania	EU	28	20
YS	El Salvador	NA	11	07
YT-YU, YZ	Yugoslavia	EU	28	15
YV-YY	Venezuela	SA	12	09
YV0	Aves I.	NA	11	08
Z2	Zimbabwe	AF	53	38
Z3[41]	Macedonia	EU	28	15
ZA	Albania	EU	28	15
ZB2	Gibraltar	EU	37	14
ZC4[42]	UK Sov. Base Areas on Cyprus	AS	39	20
ZD7	St. Helena	AF	66	36
ZD8	Ascension I.	AF	66	36
ZD9	Tristan da Cunha & Gough Is.	AF	66	38
ZF	Cayman Is.	NA	11	08
ZK1	N. Cook Is.	OC	62	32
ZK1	S. Cook Is.	OC	62	32
ZK2	Niue	OC	62	32
ZK3	Tokelau Is.	OC	62	31
ZL-ZM	New Zealand	OC	60	32
ZL7	Chatham Is.	OC	60	32
ZL8	Kermadec Is.	OC	60	32
ZL9	Auckland & Campbell Is.	OC	60	32
ZP	Paraguay	SA	14	11
ZR-ZU	South Africa	AF	57	38
ZS8	Prince Edward & Marion Is.	AF	57	38

DXCC Countries List Notes

1. Unofficial prefix.
2. (5T) Only contacts made June 20, 1960, and after, count for this entity.
3. (5U) Only contacts made August 3, 1960, and after, count for this entity.
4. (6W) Only contact made June 20, 1960, and after, count for this entity.
5. (70) Only contacts made May 22, 1990, and after, count for this entity.
6. (9A,S5) Only contacts made June 26, 1991, and after, count for this entity.
7. (9G) Only contacts made March 5, 1957, and after, count for this entity.
8. (9M2,4,6,8) Only contacts made September 16, 1963, and after count for this entity.
9. (9U, 9X) Only contacts made July 1, 1962, and after, count for this entity.
10. (9V) Contacts made from September 16, 1963 to August 8, 1965, count for this for West Malaysia.
11. (BS7) Only contacts made January 1, 1995, and after, count for this entity.
12. (BV9P) Only contact made January 1, 1994, and after, count for this entity.
13. (D6,FH) Only contacts made July 6, 1975, and after, count for this entity.
14. (DA-DL) Only contacts made with DA-DL stations September 17,1973, and after, and contacts made Y2-Y9 stations October 3, 1990 and after, count for this entity.
15. (E3) Only contacts made November 14, 1962, and before, or May 24, 1991, and after, count for this entity.
16. (FO) Only contacts made after 23:59 UTC, March 31, 1998 count for this entity.
17. (FR) Only contacts made June 25, 1960, and after, count for this entity.
18. (H40) Only contacts made after 23:59 UTC, March 31, 1998 count for this entity.
19. (JD) Formerly Marcus Island.
20. (JD) Formerly Bonin and Volcano Islands
21. (KC6) Includes Yap Islands December 31, 1980, and before.
22. (KP5) Only contacts made March 1, 1979, and after, count for this entity.
23. (OK-OL, OM) Only contacts made January 1, 1993, and after, count for this entity.
24. (P2) Only contacts made September 16, 1975, and after count for this entity.
25. (P4) Only contacts made January 1, 1986, and after, count for this entity.
26. (P5) Only contacts made May 14, 1995, and after, count for this entity.
27. (S0) Contacts with Rio de Oro (Spanish Sahara), EA9, also count for this entity.
28. (T2) Only contacts made January 1, 1976, and after, count for this entity.
29. (T9) Only contacts made October 15, 1991, and after, count for this entity.
30. (TL) Only contacts made August 13, 1960, and after, count for this entity.
31. (TN) Only contacts made August 15, 1960, and after, count for this entity.
32. (TR) Only contacts made August 17, 1960, and after, count for this entity.
33. (TT) Only contacts made August 11, 1960, and after, count for this entity.
34. (TU) Only contacts made August 7, 1960, and after, count for this entity.
35. (TY) Only contacts made August 1, 1960, and after, count for this entity.
36. (TZ) Only contacts made June 20, 1960, and after, count for this entity.
37. (V4,VP2) For DXCC credit for contacts made May 31, 1958, and before, see page 97, June 1958 *QST*.
38. (V6) Includes Yap Islands January 1, 1981, and after.
39. (XT) Only contacts made August 16, 1960, and after, count for this entity.
40. (YB) Only contacts made May 1, 1963, and after, count for this entity.
41. (Z3) Only contacts made September 8, 1991, and after, count for this entity.
42. (ZC4) Only contacts made August 16, 1960, and after, count for this entity.
43. (E4) Only contacts made February 1, 1999, and after, count for this entity.

Also 3Y, 8J1, AT0, DP0, FT8Y, LU, OR4, VK0, R1AW, VP8, ZL5, ZS1, ZX0, etc. QSL via country under whose auspices the particular station is operating. The availability of a third-party traffic agreement and a QSL Bureau applies to the country under whose auspices the particular station is operating.

Zone Notes can be found with Prefix Cross References.

DELETED ENTITIES

Credit for any of these entities can be given if the date of contact in question agrees with the date(s) shown in the corresponding footnote. Entities deleted after 23:59 UTC 31 March 1998 will not be included in the Deleted List.

Prefix	Entity	Conti-nent	ZONE ITU	ZONE CQ
(2)	Blenheim Reef	AF	41	39
(3)	Geyser Reef	AF	53	39
(4)	Abu Ail Is.	AS	39	21
1M(1),(5)	Minerva Reef	OC	62	32
4W(6)	Yemen Arab Rep.	AS	39	21
7J1(7)	Okino Tori-shima	AS	45	27
8Z4(8)	Saudi Arabia/Iraq Neut. Zone	AS	39	21
8Z5, 9K3(9)	Kuwait/Saudi Arabia Neut. Zone	AS	39	21
9S4(10)	Saar	EU	28	14
9U5(11)	Ruanda-Urundi	AF	52	36
AC3(1),(12)	Sikkim	AS	41	22
AC4(1),(13)	Tibet	AS	41	23
C9(14)	Manchuria	AS	33	24
CN2(15)	Tangier	AF	37	33
CR8(16)	Damao, Diu	AS	41	22
CR8(16)	Goa	AS	41	22
CR8, CR10(17)	Portuguese Timor	OC	54	28
DA-DM(18)	Germany	EU	28	14
DM, Y2-9(19)	German Dem. Rep.	EU	28	14
EA9(20)	Ifni	AF	37	33
FF(21)	French West Africa	AF	46	35
FH, FB8(22)	Comoros	AF	53	39
FI8(23)	French Indo-China	AS	49	26
FN8(24)	French India	AS	41	22
FQ8(25)	Fr. Equatorial Africa	AF	47,52	36
HK0(26)	Bajo Nuevo	NA	11	08
HK0, KP3, KS4(26)	Serrana Bank & Roncador Cay	NA	11	07
I1(27)	Trieste	EU	28	15
I5(28)	Italian Somaliland	AF	48	37
JZ0(29)	Netherlands N. Guinea	OC	51	28
KR6, 8, JR6, KA6(30)	Okinawa (Ryukyu Is.)	AS	45	25
KS4(31)	Swan Is.	NA	11	07
KZ5(32)	Canal Zone	NA	11	07
OK-OM(33)	Czechoslovakia	EU	28	15
P2, VK9(34)	Papua Territory	OC	51	28
P2, VK9(34)	Terr. New Guinea	OC	51	28
PK1-3(35)	Java	OC	54	28
PK4(35)	Sumatra	OC	54	28
PK5(35)	Netherlands Borneo	OC	54	28
PK6(35)	Celebe & Molucca Is.	OC	54	28
ST0(36)	Southern Sudan	AF	47,48	34
UN1(37)	Karelo-Finnish Rep.	EU	19	16
VO(38)	Newfoundland, Labrador	NA	09	02,05
VQ1, 5H1(39)	Zanzibar	AF	53	37
VQ6(40)	British Somaliland	AF	48	37
VQ9(40)	Aldabra	AF	53	39
VQ9(40)	Desroches	AF	53	39
VQ9(40)	Farquhar	AF	53	39
VS2, 9M2(42)	Malaya	AS	54	28
VS4(42)	Sarawak	OC	54	28
VS9A, P, S(43)	People's Dem. Rep. of Yemen	AS	39	21
VS9H(44)	Kuria Muria I.	AS	39	21
VS9K(45)	Kamaran Is.	AS	39	21
ZC5(42)	British North Borneo	OC	54	28
ZC6, 4X1(46)	Palestine	AS	39	20
ZD4(47)	Gold Coast, Togoland	AF	46	35
ZS0, 1(48)	Penguin Is.	AF	57	38
ZS9(49)	Walvis Bay	AF	57	38

Deleted countries Notes

1. Unofficial prefix.
2. (Blenheim Reef) Only contacts made from May 4, 1967, to June 30, 1975, count for this entity. Contacts made July 1, 1975, and after, count as Chagos (VQ9).
3. (Geysey Reef) Only contacts made from May 4, 1967, to February 28, 1978, count for this entity.
4. (Abu Ail Is.) Only contacts made March 30, 1991, and before, count for this entity.
5. (1M) Only contacts made from July 15, 1972, and before, count for this entity. Contacts made July 16, 1972, and after, count as Tonga (A3).
6. (4W) Only contacts made before May 21, 1990, and before, count for this entity.
7. (7J1) Only contacts made May 30, 1976, to November 30, 1980, count for this entity. Contacts made December 1, 1980, and after entity as Ogasawara (JD1).
8. (8Z4) Only contacts made December 25, 1981, and before, count for this entity.
9. (8Z5,9K3) Only contacts made December 14, 1969, and before, count for this entity.
10. (9S4) Only contacts made March 31, 1957, and before, count for this entity.
11. (9U5) Only contacts made from July 1, 1960, to June 30, 1962, count for this entity. Contact made July 1, 1962, and after, count as Burundi (9U) or Rwanda (9X).
12. (AC3) Only contacts made April 30, 1975, and before, count for this entity. Contacts made May 1, 1975, and after, count as India (VU).
13. (AC4) Only contacts made May 30, 1974, and before, count for this entity. Contact made May 31, 1974, and after, count as China (BY).
14. (C9) Only contacts made September 15, 1963, and before, count for this entity. Contact made September 16, 1963, and after, count as China (BY).
15. (CN2) Only contacts made June 30, 1960, and before, count for this entity. Contact made July 1, 1960, and after, count as Morocco (CN).
16. (CR8) Only contacts made December 31, 1961, and before, count for this entity.
17. (CR8,CR10) Only contacts made September 14, 1976, and before, count for this entity.
18. (DA-DM) Only contacts made September 16, 1973, and before, count for this entity. Contacts made September 17, 1973, and after, count as either FRG (DA-DL) or GDR (Y2-Y9).
19. (DM,Y2-9) Only contacts made from September 17, 1973, to October 2, 1990 count for this entity. On October 3, 1990 the GDR became part of the FRG.
20. (EA9) Only contacts made May 13, 1969, and before, count for this entity.
21. (FF) Only contacts made August 6, 1960, and before, count for this entity.
22. (FH, FB8) Only contacts made July 5, 1975, and before, count for this entity. Contacts made July 6, 1975, and after, count as Comoros (D6) or Mayotte (FH).
23. (FI8) Only contacts made December 20, 1950, and before, count for this entity.
24. (FN8) Only contacts made October 31, 1954, and before, count for this entity.
25. (FQ8) Only contacts made August 16, 1960, and before will count for this entity.
26. (HK,KP3,KS4) Only contacts made September 16, 1981, and before, count for this entity. Contacts made September 17, 1981, and after, count as San Andres (HK).
27. (I1) Only contacts made March 31, 1957, and before, count for this entity.
28. (I5) Only contacts made June 30, 1960, and before, count for this entity.
29. (JZ) Only contacts made April 30, 1963, and before, count for this entity.
30. (KR6,8,JR6,KA6) Only contacts made May 14, 1972, and before, count for this entity. Contacts made May 15, 1972, and after, count as Japan (JA).

31. (KS4) Only contacts made August 31, 1972, and before, count for this entity. Contacts made September 1, 1972, and after, count as Honduras (HR).
32. (KZ5) Only contacts made September 30, 1979, and before, count for this entity.
33. (OK-OM) Only contacts made December 31, 1992, and before, count for this entity.
34. (P2,VK9) Only contacts made September 15, 1975, and before, count for this entity. Contacts made September 16, 1975, and after, count as Papua New Guinea (P2).
35. (PK1-6) Only contacts made April 30, 1963, and before, count for this entity. Contact made May 1, 1963, and after, count as Indonesia.
36. Only contacts made between May 7, 1972 and December 31, 1994, count for this entity.
37. (UN1) Only contacts made June 30, 1960, and before, count for this entity. Contacts made July 1, 1960, and after count as European RSFSR (UA).
38. (VO) Only contacts made March 31, 1949, and before, count for this entity. Contacts made April 1, 1949, and after, count as Canada (VE).
39. (VQ1,5H1) Only contacts made May 31, 1974, and before, count for this entity. Contacts made June 1, 1974, and after, count as Tanzania (5H).
40. (VQ6) Only contacts made June 30, 1960, and before, count for this entity.
41. (VQ9) Only contacts made June 28, 1976, and before, count for this entity. Contacts made June 29, 1976, and after, count as Seychelles (S7).
42. (VS2,VS4,ZC5,9M2) Only contacts made September 15, 1963, and before, count for this entity. Contacts made September 16, 1963, and after, count as West malaysia (9M2) or East Malaysia (9M6,8).
43. (VS9A,P,S) Only contacts made before May 22, 1990, and before, count for this entity.
44. (VS9H) Only contacts made November 29, 1967, and before, count for this entity.
45. (VS9K) Only contacts made on March 10, 1982, and before, count for this entity.
46. (ZC6,4X1) Only contacts made June 30, 1968, and before, count for this entity. Contacts made July 1, 1968, and after, count as Israel (4X).
47. (ZD4) Only contacts made March 5, 1957, and before, count for this entity.
48. (ZS0, 1) Only contacts made February 29, 1994, and before, count for this entity.
49. (ZS9) Only contacts made from September 1, 1977 to February 28, 1994, count for this entity.

PREFIX CROSS REFERENCES

A8 = EL
AC (before 1972) = A5
AH = KH
AL7 = KL7
AM-AO = EA
AT-AW = VU
AX = VK
AY-AZ = LU
CF-CK = VE
CL = CO
CQ-CS = CT
CR3 (before 1974) = J5
CR4 (before 1976) = D4
CR5 (before 1976) = S9
CR6 (before 1976) = D2
CR7 (before 1976) = C9
CR9 (before 1985) = XX9
CT2 (before 1986) = CU
CXØ = CE9/VP8
CY-CZ = VE
CYØ (before 1985) = CY9
D7 = HL
DM-DT (before 1980) = Y2-9
DS-DT = HL
E2 = HS
EAØ (before 1969) = 3C
EK, EM-EO, ER-ES, EU-EZ = U
ER (after 1992) = UO
EU (after 1991) = UC
FA-FF (after 1983) = F
FA (before 1963) = 7X
FB8 (before 1961) = 5R
FB8 (before 1985) = FT
FC (before 1985) = TK
FD8 (before 1961) = 5V
FE8 (before 1961) = TJ
FL (before 1978) = J2
FU8 (before 1982) = YJ
GB = G
GC (before 1977) = GJ/GU
H2 = 5B
H3 = HP
H5 (Bophutatswana) = ZS
H7 = YN
HE = HB
HM (before 1982) = HL
HT = YN
HU = YS
HW-HY = F
J4 = SV
KA1 = JD1
KA2AA-KA8ZZ = JA
KB6 (before 1979) = KH1
KC4 (Navassa) = KP1
KC6 (before 1990) = V6
KG6 (before 1979) = KH2
KG6I (before 1970) = JD1
KG6R, S, T, (before 1979) = KHØ
KJ6 (before 1979) = KH3
KH7 (before 1998) = KH7K
KM6 (before 1979) = KH4
KP4 (Desecheo) = KP5
KP6 (before 1979) = KH5
KS6 (before 1979) = KH8
KV4 (before 1979) = KP2
KW6 (before 1979) = KH9
KX6 (before 1990) = V7
L2–9 = LU
M1 (before 1984) = T7
MP4B (before 1972) = A9
MP4M (before 1972) = A4
MP4Q (before 1972) = A7
MP4T, D (before 1972) = A6
NH = KH
NL7 = KL7
NP = KP
OQ (before 1961) = 9Q
P3 = 5B
P4 (before 1986) = PJ
PX (before 1970) = C3
RA, RN = UA
RB-RR = UB-UR
RS = U
RT = UB
RU-RX = U
S4 (Ciskei) = ZS
S8 (Transkei) = ZS
T4 = CO
T4 (Venda) = ZS
T8 = KC6
TH, TM, TO-TQ, TV-TX = F
UB (before 1994) = UZ
UC (before 1994) = EU
UD (before 1994) = 4J
UF (before 1994) = 4L
UG (before 1994) = EK
UH (before 1994) = EZ
UI (before 1994) = UJ
UJ (before 1994) = EY
UL (before 1994) = UN
UM (before 1994) = EX
UO (before 1994) = ER
UP (before 1991) = LY
UQ (before 1992) = YL
UR (before 1991) = ES
V9 (Venda) = ZS
VA-VG = VE
VH-VN = VK
VK9 (Nauru) = C2
VP1 (before 1982) = V3
VP2A (before 1982) = V2
VP2D (before 1979) = J7
VP2G (before 1975) = J3
VP2K (before 1984) = V4 or VP2E
VP2L (before 1980) = J6
VP2S (before 1980) = J8
VP3 (before 1967) = 8R
VP4 (before 1963) = 9Y
VP5 (Jamaica) = 6Y
VP5E = VP2E
VP6 (before 1967) = 8P
VP7 (before 1974) = C6
VQ2 (before 1965) = 9J
VQ3 (before 1962) = 5H
VQ4 (before 1964) = 5Z
VQ5 (before 1963) = 5X
VQ8 (before 1969) = 3B
VQ8 (Chagos) = VQ9
VQ9 (Seychelles) = S7
VR1 (before 1980) = T3
VR2 (before 1971) = 3D2
VR2 (after 1991) = VS6
VR3 (before 1980) = T32
VR4 (before 1979) = H4
VR5 (before 1971) = A3
VR8 (before 1979) = T2
VS1 (before 1966) = 9V
VS5 (before 1985) = V8
VS7 (before 1949) = 4S
VS9M = 8Q
VS9O (before 1961) = A4
VX-VY = CYØ/VE
WH = KH
WL7 = KL7
WP = KP
XJ-XO = VE
XP = OX
XQ-XR = CE
XV = 3W
XX7 (before 1976) = C9
YU2 (1992) = 9A
YU3 (1992) = S5
YU4 (before 1992) = T9
YU5 (before 1992) = Z3
ZB1 (before 1965) = 9H
ZD1 (before 1962) = 9L
ZD2 (before 1961) = 5N
ZD3 (before 1966) = C5
ZD5 (before 1969) = 3DA
ZD6 (before 1965) = 7Q
ZE (before 1981) = Z2–9
ZK9 (1983) = ZK2
ZM6 (before 1963) = 5W
ZM7 (before 1984) = ZK3
ZS3 (before 1991) = V5
ZS7 (before 1969) = 3D6
ZS8 (before 1967) = 7P
ZS9 (before 1967) = A2
ZV-ZZ = PY
2D = GD
2E = G
2I = GI
2J = GJ
2M = GM
2U = GU
2W = GW
3B-3C (before 1968) = VE
3D6 (before 1988) = 3DA
3G = CE
3Z = SP
4A-4C = XE
4D-4I = DU
4J-4L = U
4J (after 1991) = UG
4J1F (before 1994) = R1MV
4K (before 1994) = UA
4K1 (before 1994) = CE9/KC4
4K2 (before 1994) = R1FJ
4K3 (before 1994) = UA
4K4 (before 1994) = UAØ
4L (after 1991) = UF
4M = YV
4N-4O = YU
4T = OA
4U1VIC = OE
4V = HH
5J-5K = HK
5L-5M = EL
6C = YK
6D-6J = XE
6K-6N = HL
6O = T5
6T-6U = ST
7A-7I = YB
7G (before 1967) = 3X
7J-7N = JA, JD
7J1 = JA1 or JD1
7S = SM
7Z = HZ
8A-8I = YB
8J-8N = JA
8O = A2
8S = SM
9A (before 1984) = T7
9B-9D = EP
9E-9F = ET

CONTINENTS

AF	= AFRICA
AN	= ANTARCTICA
AS	= ASIA
EU	= EUROPE
NA	= NORTH AMERICA
OC	= OCEANIA
SA	= SOUTH AMERICA

ZONE NOTES

(A)	33, 42, 43, 44
(B)	67, 69-74
(C)	12, 13, 29, 30, 32, 38, 39
(D)	12, 13, 15
(E)	19, 20, 29, 30
(F)	20-26, 30–35, 75
(G)	16, 17, 18, 19, 23
(H)	2, 3, 4, 9, 75
(I)	55, 58, 59

AMATEUR SATELLITES

by
IRVING SPACKMAN
ZL1MO

The Amateur Satellite Service has come a long way in the 39 years since the historic day in 1961, when Amateur Radio entered the region beyond the ionosphere with the launch of OSCAR 1.

On October 15 1972, OSCAR-6 was launched, to provide the first long-life Mode-A Amateur Communication Spacecraft. In addition, AO-6 carried a rudimentary digital Code-Store and a 70 cm beacon, which, although it failed after three months, set the stage for the use of 70 cm as a downlink in the future generation of Mode-J spacecraft.

There are currently 14 Spacecraft in orbit operating in the Amateur Satellite Service with another—Phase-3D—due for launch hopefully before the end of 2000.

Satellite frequency allocations

International agreements have made provision for the Amateur Satellite Service to operate in the 7, 14, 21, 24, 29, 144, 435, and 1260 MHz bands, plus the 2.4, 3.4, 5.6, 10, 24, 47, 75, 142 and 240 GHz allocations. However, so far operation has only been in the bands shown in Table 1.

Amateur satellite terminology

OSCAR stands for "Orbital Satellite Carrying Amateur Radio", while "RS" is used to identify the Russian Amateur satellites because they send RS in their identifying call. UoSATS (University of Surrey Satellites) are identified as UoSAT-OSCARs, giving rise to the abbreviation UO-11 etc. The latest satellite launched by Japan for JAMSAT/JARL as JAS-2 (Japan Amateur Satellite) was called FUJI OSCAR-29 or FO-29. The earlier FO-20 is in its 10th year and due to battery failure has a limited life. Operation of satellite transponders are specified by the "Mode", which identifies the frequencies being handled via the transponder. The current types are shown in Table 2.

NOTE: In some cases two modes may be operated simultaneously.

Later this year, with the launch and activation of the Phase-3D satellite, an alternative terminology, describing the uplinks and downlinks which will be connected for a particular day or period will be used. This terminology uses the part of the frequency spectrum where the transponder(s) will be operating as the reference. If launch and commissioning go to plan, see subsequent *Break-In* columns for details of frequencies and modes available.

Orbital information and predictions

The orbital reference data used to make prediction calculations is obtained from a set of mathematically precise numbers known as Keplerian Orbital Elements, named after the mathematician and astronomer Johannes Kepler. He was able to formulate a set of rules which all orbiting bodies obey. This data is nowdays derived from radar, or optical observation of each spacecraft on a regular basis, and refined over time by organisations such as NORAD and distributed by NASA.

AMSATs receive a complete suite of Keplerian Element sets weekly from NASA for all the amateur, weather and other satellites of interest, and distribute them via bulletins placed on all the satellites and world-wide Packet radio networks, appearing within a short time on our shores.

If you are not able to locate valid up-to-date elements contact ZL1MO via phone or mail for assistance.

The use of the personal computer to calculate information relating to the bearing and elevation from a particular station to each satellite as it comes within range is now commonplace. There are a number of tracking programs written for use with most common personal computers. Most of the software has been written for the IBM PCs and clones, and some has been developed for other brands. Apart from creating time related tracking information, some programs can control the position of the antennas, tune the radio equipment or show coloured maps of the earth, displaying the track of the spacecraft and the "footprint" of the region which can access the spacecraft at that time.

Note that some of the software used pre-2000 was not Y2K compatible. Many of the packages have been re-written but some such as QUIKTRAK have not been updated. Currently, InstanTrack which was not Y2K capable is being used by a modification to the Keplerian Element Set, with a software "patch". A new version of InstanTrack is being developed.

Other programs permit the PC to interact directly with the digital satellites, automatically uploading and downloading files containing personal mail or information in the form of bulletins or graphics, which have either been uploaded from other ground stations or generated from images captured by the spacecraft and stored for later access.

Where do i get more information?

There are several AMSAT Organizations around the world who publish journals on a regular basis for their members. Here in New Zealand we have our own organization—AMSAT-ZL—membership of which yields a variety of services.

On Sunday nights there is a brief satellite report containing predictions and late breaking news available from both the Waikato VHF Group (695) and Auckland VHF Group (6625 and linked region repeater) nets.

A considerable amount of satellite news can be found on your local packet radio BBS. With the assistance of the various SYSOPs who forward material derived directly from the satellites, and other regular contributors, much up-to-date information can arrive on the BBS network within a few hours.

In the NZART journal *Break-In* there is a comprehensive coverage of the amateur satellite activities and other space related topics. Membership of the Association provides the magazine and many other services!

For more information on the various AMSAT organisations or other topic covered herein, contact ZL1MO (call-book address) enclosing an SASE. For information regarding software, please include details of your needs, type of computer and its facilities such as drive type(s).

Table 1

Band	Frequencies	Remarks
15 m	21.25 to 21.30 MHz	Uplink frequency used.
10 m	29.30 to 29.50 MHz	Downlink frequency used.
2 m	145.80 to 146.00 MHz	Both up and downlinks.
70 cm	435.00 to 438.00 MHz	Both up and downlinks.
23 cm	1260 to 1270 MHz	Uplink only permitted.
13 cm	2400 to 2449 MHz	Downlink only used.

Table 2

Mode	Uplink (MHz)	Downlink (MHz)
A	145.8–146.0	29.3–29.5
B	435.0–438.0	145.8–146.0
J	145.8–146.0	435.0–438.0
K	21.25–21.30	29.3–29.5
L	1269.0–1270.0	435.0–436.0
S	435.0–438.0	2401.0–2404.0
T	21.25–21.30	145.8–146.0

Operational amateur spacecraft

The following spacecraft are operational as at May 1 2000. For operating frequencies and other information see the listing at the end. These are listed in order, using the NASA Catalogue number.

OSCAR-10: Cat. 14129. Limited Mode-B operation possible depending on Satellite/Sun relationship. On-Board Computer (OBC) non-operational due to radiation damage to memory, thus preventing any attitude changes to spacecraft. Spacecraft spin rate so low that it may no longer have stable attitude and so regular active periods can no longer be predicted.

UoSAT-2 (UO-11): Cat. 14781. Amateur Band research and technology satellite. Currently transmitting on 2 m an extensive range of data and text in ASCII format at 1200 bps AFSK using 1200 and 2400 Hz tones. Also the Mode-S beacon on 2401.5 MHz (± Doppler) is usually activated but is running at reduced power due to a fault.

UoSAT-3 (UO-14): Cat. 20437 was a Mode-J Digital Satellite operating at 9600 bps. As the first Amateur 9600 bps "digisat", it operated until the launch of UO-22 when it was moved to non-amateur frequencies. Recently, as its Digital Processor had failed, it was returned to Amateur Service with a VHF uplink/UHF downlink providing a single channel FM repeater.

PACSAT AO-16: Cat. 20439. Mode-J AX25 1200 bps. Only the Digipeater is operational since a OBC crash some months ago. Downlink SSB with PSK Modulation—Uplink Manchester Encoded NBFM. A Mode-S beacon on 2401.143 MHz (± Doppler) can be turned on for 24 hour periods when the spacecraft has sufficient battery voltage,

LUSAT LO-19: Cat. 20442. AMSAT-Argentina's PACSAT. LUSAT also is only operating as a digipeater. Uplink and Downlink Transmission formats as for AO-16.

FUJI-OSCAR-20 (FO-20): Cat. 20480. Mode-J Analogue (Voice) only.

RS-13: (COSMOS 2123): Cat. 21089. This satellite is an amateur system riding on and deriving power from COSMOS 2123. RS-13 can operate under modes K, A, and T. Currently RS-13 is operating, using Mode-KA.

UoSAT-5 (UO-22): Cat. 21575. Mode-J PACSAT operating at 9600 bps capable of carrying up to 800 messages. These files can be downloaded using special software and receivers modified to pass the higher data rate.

ITAMSAT-OSCAR-26 (IO-26): Cat. 22826. AMSAT-Italy's version of the PACSAT. ITAMSAT is also operating as a digipeater using the same Up and Downlink formats as AO-16.

KITSAT-B (KO-25): Cat. 22830. This satellite was built and commissioned by a Korean team after working on a previous satellite KO-23 at University of Surrey. KO-25 is controlled from a Korean Command Centre at KAIST. In an orbit similar to that of UO-22, KO-25 also uses Mode-J 9600 bps FSK BBS, and periodically carries images taken with high definition wide and narrow view cameras.

FUJI-OSCAR-29 (FO-29): Cat. 24278. Mode-J Analogue & Digital Satellite plus digitized voice synthesizer. The digital mode only operates now at 1200 bps PSK alternating with an Analogue Voice Mode. Sometimes FO-29's DIGI-TALKER is activated as part of the schedule. Note—A standard packet communication program will operate with FO-29's 1200 bps BBS.

TMSAT-OSCAR-31 (TO-31): Cat. 25396. Mode-J Digital Satellite built at University of Surrey for a team from Bankok, where the Command Centre is located. The Uplink uses 9600 bps FM, while downlink can use from 9600 to 38.4 KB. The higher speed is desirable for downlinking images.

SUNSAT (SO-35): Cat. 25636. Multi facility Amateur/Non Amateur Satellite. Has VHF and UHF Amateur Equipment. Currently, a Mode-B FM Single Channel Transponder and a "Parrot" digital speech synthesiser have been used. Scheduled operation has been a problem due to variable power availability as the orbit moves from partial eclipse to full sunlight conditions.

UoSAT-12 (UO-36): Cat 25693. This Spacecraft also called Merlion is a technology development spacecraft for a new generation of UoSATs. The Amateur side consists of a Digital Imaging Spacecraft with Mode-J uplink operating at 9600 bps and Downlink, following commissioning, at 38.4 KB. In addition an experimental Mode-S downlink can be used.

Amateur radio on manned spacecraft

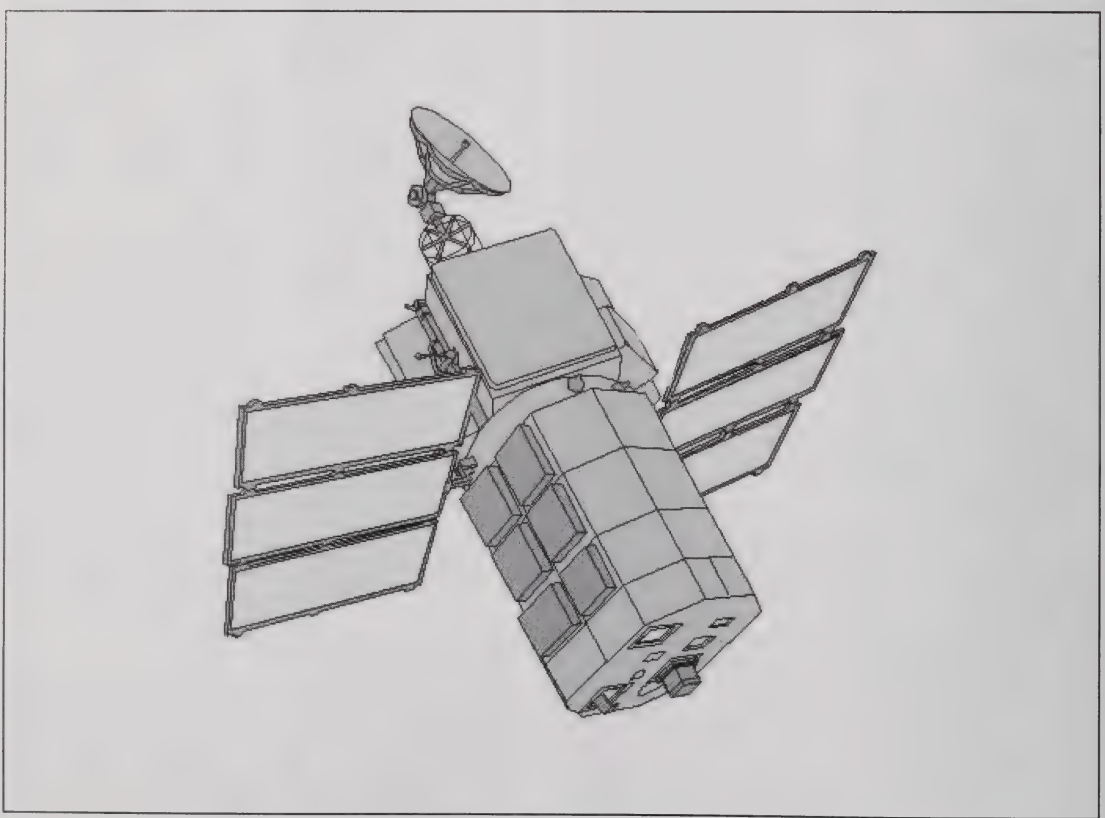
Amateur Radio operation has been a regular feature from the Russian MIR space station, and from some NASA Shuttle Missions, where it is called Shuttle Amateur Radio Experiment (SAREX). Amateur Radio on MIR was also activated regularly by the various American Astronauts who were stationed on MIR, but which concluded in 1998.

The Cosmonauts are generally licensed Amateurs and use simplex voice operation on 145.985 MHz using a series of Russian assigned -MIR calls. MIR also carries two other Amateur Station facilities. One is a 1200 baud standard packet radio Personal Message System (PMS) to allow ground-based amateurs to leave personal mail and bulletins for the cosmonauts, but is not a flying BBS and must not be used as such. The PMS is now a KAM 9612 Terminal Node Controller (TNC) with about 100 kbytes of message storage. The second is a Slow Scan TV system with a camera which provides both internal and external pictures, some with excellent subject material.

Note that Amateur Radio Voice operation by the Cosmonauts is used as a part of their recreation, and is therefore not a scheduled activity, being generally limited to their non-work times. However both Packet and SSTV equipment is operating at other times.

Operation on MIR ceased during 1999 with no one on board due a plan to de-orbit the spacecraft. At present two cosmonauts are on board supported by some private finance, to extend MIR's operations, but for how long, is uncertain. Russian funds now are needed to meet their committment to the International Space Station.

There has been extensive planning done by an International team of Amateurs, supported by NASA, for the inclusion of Amateur Radio facilities on the International Space Station. Currently the next component parts of the station are well behind schedule, but some Amateur Equipment has been readied and approved, and is manifested to fly on a Space Shuttle Mission due for launch mid-May 2000.



AMATEUR SATELLITE SHORT FORM FREQUENCY LIST

(as at April 30 2000) Make photocopy for your shack!

Satellite Callsign

Analog Use	Uplink		Downlink		Type
AO-10	435.025–435.175	L	145.975–145.825	UB	Mode-B Analogue TxP
RS-13	21.260–21.300	U	29.460–29.500	UB	Mode-K Analogue TxP
RS-13	145.960–146.000	U	29.460–29.500	UB	Mode-A Analogue Txp
FO-20	145.900–146.000	L	435.900–435.800	UB	Mode-J Analogue TxP
FO-29	145.900–146.000	L	435.900–435.800	UB	Mode-J Analogue TxP
UO-14	145.975	FM	437.070 ±9KHz	FM	Mode-J One Chl
SO-35	436.291 ±9KHz	FM	145.825 (Note 9)	FM	Mode-B One Chl

Digital Use						
UO-11	UoSAT-2			145.825	FB	ASCII Text/Data
AO-16	PACSAT	145.90,.92,.94,.96	MF	437.025	UP	1200 BPS Digi
LO-19	LUSAT	145.84,.86,.88,.90	MF	437.150	UP	1200 BPS Digi
IO-26	ITMSAT	145.875,.90,.925	MF	435.822	UP	1200 BPS Digi
UO-22	UoSAT-5	145.90, 145.975	WF	435.120	WF	9600 BPS AX25 BBS
KO-25	HL02	145.87, 145.98	WF	436.500	WF	9600 BPS AX25 BBS
FO-29	8J1JCS	145.85,.87,.89,.91	MF	435.910	UP	1200 BPS AX25 BBS
TM-31	TMSAT-1	145.925 (Note 7)	WF	436.925	WF	9600 BPS AX25 BBS
UO-36	UoSAT-12	145.960	WF	437.025	WF	9600 BPS AX25 BBS
		As above (Note 8)	WF	437.400	WF	38.4KBPS AX25 BBS.

Legend

B: Beacons : AO-10 145.810 Unmodulated; RS13 Mode-KA 29.458 & 29.504; FO-20 & FO-29 have CW beacon 435.795; UO-11 2401.500 Weak.

F: FM Narrow Band 15 KHz Deviation max.

L: Lower Sideband normal use.

M: 1200 BPS Manchester Encoded Data modulating FM.

P: PSK Modulation—Use SSB narrow band Receiver and PSK Modem.

U: Upper Sideband normal use.

WF: FM Deviation up to 20 KHz due to higher data rate.

Notes

(1) Frequencies shown are centre frequencies – Doppler of up to ±9 kHz on 70 cm and ±3 kHz on 2 m will be found on higher elevation passes.

(2) AO-10 is not able to be controlled due to a failure of the OBC and batteries. Operates when in sunlight in Mode-B. Good performance depends on spacraft attitude which cannot be controlled, but changes slowly with time.

(3) AO-10 and FO-20/29 Analogue Transponders use inverting systems to reduce the effect of Doppler. Transmission of LSB produces USB on the downlink, while an downward shift of frequency on the uplink produces an equivalent upward shift of frequency on the downlink.

(4) UO-11 is a "Scientific" Type spacecraft. The normal schedule includes ASCII encoded bulletins, containing latest news, telemetry and Whole Orbit Data (WOD) studies of specific on-board systems and experiments. To support an interest in our Microwave bands, the Mode-S beacon is often turned on, although it is running at reduced power.

(5) The Digital Mode Satellites (except FO-29) require a Program suite comprising PB/PG (plus PHS/PFHADD), or WiSP for "Windows-based" systems. The Upload Callsign of the spacecraft has a suffix of -12, while the B'cast Download Mode has a callsign suffix of -11.

(6) FO-29 operates with standard AX25 (similar to ground-based BBS), and requires standard 1200 bps terminal program. Connect to callsign 8J1JCS, and download Help File.

(7) TMSAT TO-31 is basically an Imaging Satellite although it can be used as a BBS. Images are generally downloaded at 9600 BPS but TO-31 has 38.4KB download capability.

(8) UO-36 is an imaging satellite using 9600 bps for uplink commands and mostly 38.4 KB downlink to transfer the large data files. Due to power constraints, this spacecraft is often not on in our area. Due to high data rate, FM receivers require 50 - 60 KHz IF bandwidth. UO-36 also has a S-Band downlink on 2401 MHz turned on occasionally.

(9) SunSat SO-35 can use its VHF and UHF systems as a single channel FM repeater similar to UO-14, but due to varying power budgets this is only active at times and not always in our region.

For any updates to the above send your enquiry with a SASE to ZL1MO at Callbook address.

AN INTRODUCTION TO THE WORLD OF DX

by RON WILLS ZL2TT

Ron Wills passed away in January 2000. Ron's ideas and tips in this "Introduction to the world of DX" are excellent and will help you become as proficient in the art and madness of DXing as Ron was.

To many newcomers to amateur radio DX is what it is "all about". Many of them have risen from the ranks of CB and the opportunity to be able to legally chase DX has been one of the major attractions of amateur radio to them.

So what is "DX" and why is it such a popular aspect of amateur radio?

"DX IS" sums it up for the real DXer. However for the newcomer DX is working long distances. Long distances are really what you want them to be. If you are new to the HF bands you may regard working VK (Australia) as DX. But if you are an experienced DXer you may consider working ZS (South Africa) is more what DX is about, especially if you do it on 80 or 160 m, rather than on one of the higher bands like 20 m.

The purpose of this article is really to give newcomers to the hobby a few pointers and to share my enthusiasm and that of other DXers with them in the hope that they will get the bug and join us in chasing DX.

So let's first of all talk about gear. What sort of station do you need to work "real" DX? Well basically anything will do, but obviously the better the gear, the better the antenna, the more likelihood you have to work DX. Yes you can work DX with 10 W and a dipole antenna but a good antenna and rig makes it easier. You can do it with QRP (low power) say 5 W but again running the full legal limit will enable you to be heard better, especially if there is QRM around.

Most DXers will agree with me when I say that the best investment you can make for your station is a good antenna system. This ideally should cover all the main HF bands. You need antennas for 80 and 40 but also for 20/15/10 and the WARC bands (10, 18 and 24 MHz) too. Now that the sunspot count is going up, and is often well over the 100, you will soon be able to work solid DX on the higher HF bands for many hours of the day. However, a good antenna for 80/40 is also very important. Getting the antennas as high up in the air as you can is critical. At 40 feet or so most antennas, especially beams, will really start to perform. Once you get really serious, and have the money and the space too, you can install some big mono band beams and be one of the big signals out of New Zealand. But you can start with a dipole or G5RV. Then as you get more enthusiastic or more frustrated, when you hear other ZLs working stations you can't even hear, you can advance to a bigger antenna system. The current theory is "go for height". Better a dipole at 100 feet than a beam at 20 feet. However I should say that I've worked close on 300 countries and never had an antenna over 35 feet on any band. But when I visit stations with big high antennas I can certainly notice the vast improvement over my set up. A good example is using the Rhombics or 1000 foot long V beams at Quartz Hill near Wellington where low noise and good antennas put you into another world of ham radio. The site can be rented from the WARC (Wellington Amateur Radio Club). Contact them or me if you want a real DX experience.

Still another characteristic of DXers is that they are never satisfied. The rig or antenna that last year was the best that money could buy and that you would never need to replace in a lifetime is starting to look like it needs an upgrade 12 months later. I have always used older second hand rigs like FT-101, TS-520s and my favourite TS-50. But having just obtained an FT-1000MP, which has to be a Rolls Royce of rigs, both quality and price wise, I have to admit it is easier and nicer to do it with a "great" rig. But really it has to be questionable whether the difference to all intents and purposes between a second hand $250 rig at a junk sale or a $5000 plus rig is really all that significant. And at least with the savings you can get a pretty good antenna system.

Anyway let's talk about DX and the challenges that it can offer. DXing can be competitive and you can get recognition for your accomplishments in chasing DX through one of amateur radio's best known certificates. I am referring to the DX Century Club or DXCC as it is more commonly known. The ARRL in the USA awards DXCC to any amateur who can prove that they have worked amateurs in at least 100 different countries. 100 countries are only the start however. There are just on 330 countries recognised by the ARRL DXCC Committee at the moment so real enthusiasts don't just have to stop at 100 countries. They try and work as many countries as there are and then aim to get onto the DXCC Honor Roll. This is a select group of amateurs who have worked just about every country in the world. There are a number of amateurs who have reached that level in New Zealand but the most famous of all was the late Jock White ZL2GX the first amateur in the world to work 300 countries.

Not satisfied with working 100 countries other DX enthusiasts try to obtain DXCC on five bands. This is called 5BDXCC. They can also try to get DXCC on CW, QRP or RTTY. The challenges never end if you want to chase DX and obtain awards and recognition for doing so.

So what constitutes a country for DXCC purposes? All of us know there are not really 300 countries in the world. In simple terms a country is any place the ARRL DXCC Committee accepts as a country for DXCC purposes. They have a number of criteria and the committee meets from time to time to discuss the status of different countries. Some new ones are added from time to time and others are deleted. New Zealand itself consists a number of countries. ZL7 Chatham Islands is a different country from New Zealand itself. Kermadec Island ZL8 is another country again. The Vatican State HV is a separate country from Italy for DXCC and Hawaii KH6 a different country from the USA.

Full details of the countries that qualify for the DXCC award can be found in this edition of the Call Book.

So you've decided that you want to chase DX. How do you go about it? In DX terms it's quite simple. You just listen, listen and then listen some more. Listening is about the best thing a prospective or even an expert DXer can do. Listening will let you know for example what band conditions are like, what the propagation is like, when bands are open, which band is best to use.

As in any other hobby it also pays to do some homework first. This includes talking to other people interested in chasing DX. There is sure to be some at your local radio club. You can meet them on the air or join one of the special DX nets where DX information is exchanged. You will also find information in the DX column in *Break-In* and in other similar amateur radio publications. Every amateur radio publication has a DX column of some form. This shows how popular DXing is all over the world. Just about everywhere you find amateurs you find keen DX enthusiasts.

Another way you can find out when DX can be contacted is by checking the propagation charts in *Break-In*. They give a good indication of when bands are likely to be open to the most popular parts of the world. If you have a computer you can get programs that allow you to do your own propagation forecasts. I have several inexpensive ones and I find they are mostly right about when I am likely to hear stations from other parts of the world.

Some people work DX just for the fun of it and are not interested in the competitive element of it or in obtaining QSL cards from the stations they have worked. They get a thrill out of talking to a fellow amateur in say Kenya and then being able to share that excitement with others. But really keen DXers who want to obtain DXCC or get on the Honour Roll won't be happy until a QSL card from the exotic DX station is sitting on the table in front of them. Sometimes this can be expensive.

As a DXer you will soon learn what an IRC is and what green stamps really are. They used to say in prison, so I am told, that cigarettes were a universal currency. In the world of DX the universal currency is IRCs and green stamps. So what are they? An IRC is an International Reply Coupon. An IRC can be exchanged at your local post office for a stamp that will get your letter airmail to most parts of the world. It is not uncommon for you to have to send a couple of IRCs at $1.80 each to a rare DX station overseas in the hope that you will get a QSL card back. Many IRCs are never given to post offices however. Rather like an extended game of pass the parcel they just seem to go from ham to ham all round the world. I have a number in my collection at the moment that go back to 1970 and I understand they are still in use. On the other hand there is a certain attraction about the use of green stamps. They are US Dollars. In many countries green stamps are more popular, and more exchangeable than IRCs. I have heard some hams complaining that they should not have to send IRCs or Green stamps and that the DXer at the other end should just meet the cost themselves, in an ideal world that would be true.

However picture a ham in some rare location like Nepal getting 1000 or 2000 QSL cards each month or even you getting that number yourself. Paying a dollar a time to send a QSL card back would soon become very expensive. Hence it is now accepted that

if you want a QSL card, especially from a rare station, you may have to at least help to meet the cost of it being sent to you. Many hams use the QSL Bureau and NZART provides an excellent and free service for its members. But normally this is very slow. A year or two to get a QSL card is not at all uncommon. Many rare countries don't even have a QSL bureau. Others only let members use their QSL bureau. The same applies with DXpeditions. This is when a group, but sometimes an individual, goes to some exotic location and activates it so that others can work a new country. These DXpeditions can cost big dollars. The DXpedition to ZL8 Kermadec Islands in May 1996, which I was part of, cost over $40,000. With an estimated 40,000 QSL cards to send out too you can imagine the postage cost if we had to meet all those costs ourselves.

If you want to get a QSL card one of the most important and obvious things you can do to improve your QSL return rate is to fill in the QSL card correctly. Get the details on your card right. Band, mode, signal report and, most of all, the time. A convention amongst DXers is that they all use UTC or universal time. It is useless working a station in some rare location and sending a QSL card with the time listed as 8.30 pm New Zealand. Many DX stations if they can't easily find the contact in the log will just stick your QSL card in the rubbish. You must use UTC for all QSO times. Get the time right too. To get the UTC time listen to WWV on 5, 10 or 15 MHz. They announce the time every minute, 24 hours a day so you can be sure your time will be right.

Learning a few key words in a foreign language will help too. Most overseas hams use English for making DX contacts so we take the use of English for granted. But you can guarantee that if you say a couple of words in the overseas station's language they will be pleased and comment on it. A ham in Japan welcomes even a simple Sayonra. There are books and tapes in many languages designed for ham use and I am happy to give details if you contact me. Writing a few phrases on the back of QSL cards in the language spoken by that station you have worked seems to work wonders. A Russian ham saying "Kia Ora Kiwi" certainly gets my attention and improves that station's chances of getting a QSL card too.

There is certain etiquette in working DX stations. It starts, of course, with listening to see who is on. A good tune round the bands will often locate new countries that you can call and work. Generally unless you have a big station it's better to answer people who are calling than to call CQ DX yourself although clearly it's not quite as simple as that. New Zealand is still regarded as a good DX catch for many overseas amateurs so a ZL calling CQ has got quite a good chance that some DX station will respond. It is a little less likely that this will occur if you live in a country full of amateurs like Japan or the USA, or you don't have a really big signal.

A well-equipped DX/Contesting station.

The first thing you must do when listening to a DX station calling CQ, for example, is see if they are giving a general or a directional call. A directional call would be CQ Japan or CQ Africa. You are not likely to be too popular if you respond to such a call if you live in ZL. However if the station gives a general CQ call or calls CQ South Pacific then clearly that station is looking for contacts in this part of the world and you are welcome to respond. Sometimes the station will be working "split". That means the DX station will call on one frequency but listen on another frequency. This is so all the stations calling on that one frequency do not blot out the frequency the DX station is using. Listen carefully and respond on the correct frequency and you are likely to get an answer. Commonly DX stations will say "listening 5 up" or "listen 5 to 10 kHz up". You then have to transmit higher in frequency if you are to succeed in being heard.

Normally very rare DX stations are easy to find. The simplest way, especially if conditions are good, is just to listen to see if there are any particular frequencies where there appears to be sheer pandemonium. Thousands of stations, or so it seems, are all calling at the same time. This is called a pile up. And it can be very frustrating because normally in a pile up the DX station will answer the strongest stations first and it can takes hours or even days before they appear to hear VK or ZL stations. A common frequency to hear pile-ups and split frequency operation is 14195 or 21295. These are both very popular DX frequencies.

One way to beat the pile up is to join a DX net. These nets give DX operators the opportunity to work stations in a controlled way with a net control station that acts as MC and thus ensures that even the little stations get a crack at the DX stations. Some nets are well run and others could do with some improvements. Some people hate them, some love them but most, I think, would see them as a mixed blessing. DXing like any hobby does depend on individual integrity. You know if you had a genuine contact with the station. You know if the net control "helped" you beyond what they should have done and it is over to you to decide if you want to claim that contact or not. The best policy is, if in doubt don't claim it. Most nets, however, are well run. They guard their good reputations and don't want to put them into doubt.

There are a considerable number of DX nets that you can check into. They all welcome ZL stations. But two I like to use are the 14222 net at 0530 UTC and the ANZA (Australia, New Zealand, Africa net) that meets every day on 14183 at 0500. In both cases the net control is a VK or ZL station so you can be sure of a warm welcome. For new comers especially, these are an excellent way to get to work a lot of new countries in double quick time. Another good way is by taking part in contests. In March 1996 I took part in the CQ WW WPX contest. This is an all band contest with the aim to work as many different DX prefixes as you can. I worked over 1300 stations in 134 countries in 36 hours of operation over one weekend. If you are a new comer to DX then a contest like this one may get you a considerable number of new countries in a very short period of time.

I have met quite a number of DXers over the last few years. One thing I have found that many of them have in common is a clear focus. They set goals for themselves. My favourite example of goal setting is Graham ZL3NZ who set a goal of working 200 countries in just 20 weeks from the moment he got his licence. He got 198 countries during the period, which is a terrific achievement.

If you live in the Wellington, Auckland or Christchurch area and you have packet radio you may be able to access your local packet cluster. This can be a good way to meet other DXers and exchange current DX information with them.

I would also recommend that you do some reading. DX columns are good. There are also a number of magazines dedicated to just DX. On the Internet there is tons of DX information. There are also a number of books on how to improve your DXing skills. One I can recommend is The Complete DXer by Bob Locher W9KNI. A great book on DXing and techniques that even experts can learn from and it's available from NZART, PO Box 40-525, Upper Hutt.

Some people say that the Internet has or will kill ham radio and especially DXing. My view is quite different. I see the two as complimentary. In fact I have often used the Internet and Email in particular to correspond with hams overseas either to establish an initial contact or to exchange information or photos that you can't do so easily over the air. In fact I exchanged Emails with Villi TF3DX in Iceland for over 12 months before I was eventually able to work him on 20 m CW and then confirm the contact by his QSL card for my DXCC award.

DXing like any aspect of amateur radio is what you want it to be. You can work a few overseas countries to find out about what life is like there. You can get awards for working 100s of countries. You have the chance to compare your station with other stations in your area to see if you can get through first or even at all. You can do it 24 hours a day or an hour or so a week. One thing is sure DX is something you have to experience to appreciate. Chasing DX is not a bug but more an addictive disease!

If you are interested in finding out more about DX you can talk to one of your local DXers, join the ZL DX net or drop me a line. We are all keen to encourage more people to follow this exciting aspect of the hobby and to help you get the same fun out of it that we do.

EMC—Electromagnetic Compatability

by
BOB VERNALL
ZL2CA

Electromagnetic compatibility (or EMC for short) may sound as if it is a new topic, but it has actually been around ever since electrical equipment was first developed. Electricity, electronics and radio each have numerous applications, but there needs to be recognition of compatibility between various systems. In the case of amateur radio, the possible impacts of operating transmitters are perhaps the most obvious subject to consider for compatibility, however EMC can also crop up with various other situations, where a disturbance to normal operation is noticed. The following list of EMC situations shows the wider scope of EMC in amateur radio:

- to have a contact with a selected amateur station, but with a minimum of disturbance to or from other amateur stations;
- to have an amateur contact without disturbance with radio services in other bands, such as broadcast radio or television reception;
- to have an amateur contact without receiving disturbances from radio services in other bands, such as from broadcast radio or television transmissions or mobile services;
- to have an amateur radio contact without causing disturbances in nearby electronic apparatus, such as causing extraneous noises in hifi amplifiers or telephones, or causing errors in computers;
- to have an amateur radio contact without receiving disturbances from other electronic apparatus, such as hash from switch mode power supplies or computers.

Should EMC problems arise then there is usually some sort of trade-off among:

- the choices of EMC treatment; and
- the effectiveness of a given EMC treatment; and
- the cost of a given EMC treatment.

There should be very few, if any, circumstances where an amateur operator is forced to cease operation solely because of EMC difficulties. The end objective of clearing EMC problems should be to develop a practical result that is acceptable to all affected parties. There are advantages for amateur operators who are conversant with EMC causes and cures, as they can put their knowledge into practice should an EMC problem crop up with their station, or help others.

NZART members have recourse to being able to ask Branch EMC Officers for advice and assistance, and indirectly this includes having access to collective knowledge, experience and information within the Association.

This is a summary article on EMC for the NZART *Call Book*. The following sections briefly cover some of the EMC topics in amateur radio.

Some basic physical factors

EMC is fundamentally to do with electric or magnetic energy interactions. It is generally desirable to keep one circuit sensibly isolated from another, but sometimes coupling may arise in unforeseen ways. Coupling could be by any or all of the basic mechanisms, namely:

- Conduction (by electron currents flowing in conductors);
- Induction (by way of electric or magnetic flux linkages);
- Radiation (by way of electromagnetic fields).

Radiation is, of course, an intended part of communication by radio, so the EMC challenge is to carry out amateur radio activities with minimal unwanted interaction with other equipment or services.

In the vicinity of a transmitting antenna there are magnetic and electric energy fields that are a complex combination of reactive (stored) and radiated (outgoing) components. The specific reactive and radiated components depend on the type of antenna. The strength of the near field falls away quite rapidly with increasing separation from an antenna (that is transmitting). *Increasing the separation distance is always a winner for reducing EMC problems.* Even with EMC problems inside the shack, like one piece of equipment affecting another, it is often surprising that even a modest separation can achieve a significant reduction in the original problem.

When it comes to suppressing unwanted signals, it is usually best to work on finding the root cause and trying to stop the unwanted signal from travelling away from the source. While prevention is better than cure, if the unwanted signal can not be prevented from developing then the next strategy is to minimise the ways in which it may spread.

EMC countermeasures include the following techniques:

- Shielding (solid metal, even double screening);
- Bypassing (usually a suitable capacitor);
- Filtering (suitable series and shunt components);
- Suppression (usually within the equipment itself).

Note that many types of plastic equipment cases are transparent to RF and have useless shielding properties.

Low pass and band pass filters

Filters are one of the basic electronic building blocks that can make the difference between communications being satisfactory or unsatisfactory. There are many types of filter, designed for many applications and for many source or load impedances. Refer to a radio handbook for details on filters. Proper use of filters is central to solving many types of EMC problem.

A low pass filter in the antenna feeder can be a useful accessory for an amateur HF station. Using a low pass filter between a transceiver and the antenna can give a certain confidence to operating, as it generally results in "overkill" of possible harmonics or other unwanted emissions that happen to fall within television channels used in a given area. Without the low pass filter, some unwanted signals may make it to the antenna and thence have a good chance of spreading to local television receivers.

Be wary of the specifications of cutoff frequency for low pass filters made for HF operation. Some types of low pass filter are designed for protecting television broadcast bands used in other countries. In Europe and the USA the lowest band edge for television is 54 MHz. However, in New Zealand, television Channel 1 has a lower band edge of 44 MHz. For New Zealand television Channel 2 the lower band edge is 54 MHz. For amateur HF operation, the low pass filter should pass all of the 10 m band, but then start cutting off at higher frequencies, and have high insertion loss at the lowest television channel in your area. It so happens that some USA manufactured low pass filters are designed to include control of unwanted signals that fall in the USA television receiver IF (in the mid 40 MHz range), and these types specify high attenuation above 41 MHz, so are obviously an appropriate type of low pass filter to use anywhere in New Zealand.

Band pass filters can be useful for some amateur situations, such as for reducing strong non-amateur signals from getting into and overloading amateur receiver front ends. Field days or contests with multi-transmitter multi-band operation are examples where extra RF filtering is very useful.

Antenna considerations

Antennas are really the key to achieving overall effective performance of an amateur station. For nearly all types of antenna, the radiation efficiency and general effectiveness improve with antenna height above ground-level. The following factors can apply to high antennas:

- DX performance is usually better, on any band;
- For receiving, gives some separation from local sources of QRM;
- For transmitting, gives less exposure to ground level equipment or people;
- can run lower transmitter power and still sustain communications.

Ground-mounted vertical antennas have a reputation for having near fields that are "hotter" than those for other types of antennas. In a suburban situation, ground-mounted verticals tend to have strong radiation directly into nearby houses. By the reverse of what can happen on transmit, on receive these ground-mounted verticals can easily receive neighbourhood QRM. While verticals can be effective for communication on the lower bands, they are unfortunately also potential candidates for EMC problems in built-up areas.

Horizontal centre-fed dipole antennas are inherently much more balanced in operation than ground mounted verticals. Dipoles have surrounding flux patterns that are similar in shape each side of the centre feedpoint. The actual balance of the near field of a dipole depends on the angle from which the dipole is "viewed". A dipole viewed "side-on" presents good balance but viewed "end-on" the near side of the dipole predominates over the far side. On transmit there are unavoidable high voltages (and high field strengths) around the dipole ends. This is also the case for any antenna with an "open end".

Loop antennas are inherently one of the most balanced of all antennas. Much of the near field flux is contained within the loop. A loop antenna has a more confined near field pattern than is the case with dipoles. Loop antennas are widely reported as being quieter on receive than other types of antennas, yet are still effective for transmitting. This is basically due to the reduction in near field size and consequently reduced impact of neighbourhood QRM. Loop

antennas tend to be the better performers in the tougher EMC circumstances. A one wavelength loop can also work on near multiples of wavelengths, and with a tuning unit it can be useful on most bands. A smaller sized frame loop antenna can be useful for reception, when sited in a low noise location and with orientation to make use of the nulls broadside to the frame.

Even if a balanced type of antenna is selected for use, the actual balance of the overall antenna system depends on how the feeder is connected. If the feeder is coaxial cable then using a balun (balanced to unbalanced transformer) is one way of minimising RF current from flowing back down the outer of the coaxial cable rather than into the antenna proper. As well, a balun can minimise noise from travelling up the outer of the coaxial cable and making reception seem worse than it would be without the unwanted noise.

Antennas can develop corrosion in connections, or fatigue breaks in some strands of a multistrand wire. A bad connection or intermittent touching in a fatigued wire not only impairs performance on receive, but can cause arcing when transmitting. Arcing generally results in broad band interference and is obviously an undesirable situation. Even the best filtered transmitter in the country can cause EMC problems if there are bad connections in the antenna. Well-constructed and well-maintained antennas generally give least EMC problems. As always, antennas should be mounted "in the clear" for best communication results and least invitation for EMC problems where RF power couples into surrounding structures.

Transmitting antennas and feeders should be kept away from television antennas or downleads as otherwise it invites large levels of amateur band signals arriving at the television receiver front end.

Active antennas

An active antenna can be useful as a receiving antenna, especially where there is some localised interference. Active antennas are usually physically small and smaller size is associated with a smaller near field. While a transmitting antenna usually has "full size" dimensions for radiation efficiency reasons, when used for receiving the larger size may be worse for pickup of local interference. The main criteria for an effective active receiving antenna is that the delivered result has atmospheric noise (QRN) dominating over electronic noise (noise from the active antenna devices). It is possible for a one metre whip and a JFET input pre-amplifier to be an effective active antenna over the MF and HF bands. Siting the active antenna away from houses and power lines can often deliver a better signal to noise ratio of a wanted radio signal than for reception using a "transmitting" antenna.

An active whip can be broadband. Frame loops can also be used as active antennas, but usually need to be tuned for best results. A fairly long feeder is possible as the headend can incorporate enough active gain to compensate for some line loss. A multiwire cable is needed if power supply, tuning voltages and band switching control all need to be fed from the shack. If the power supply is mains powered, it needs to be carefully designed to resist breakthrough of mains-borne noise. Obviously the active antenna electronics need to be designed for good linearity (low intermodulation) and survival from exposure to high signals (on-site transmission from another antenna). Great operational care should be taken to not inadvertently transmit into an active antenna, as such an experience usually renders it quite inactive until repaired. Transceivers with externally looped receiver input are ideal for selecting other receiving antennas, and not exposing any to risk of a possible direct connection to a transmitter.

Commercially manufactured transceivers

These days there are a great many commercially manufactured transceivers used by amateur radio operators. While it is a shame that home construction is less popular than in yesteryear, it should not be overlooked that the commercial "appliances" bring with them a reasonably high standard of performance in terms of suppression of harmonics and other types of unwanted emissions. Nearly all commercial transceivers include a good modulating stage, good signal filtering and a reasonably designed power output stage. In some countries there are regulatory requirements for limiting unwanted emissions, so commercial transceivers need to be designed for sufficient suppression of unwanted emissions if they are to qualify for marketing in those countries. The general result is that "big name" manufacturers tend to have good pedigree for EMC, as they seek international sales potential for their products.

Power supply considerations

The humble power supply should not be overlooked as a possible EMC situation. For example, on-site hum modulation can occur when RF gets into mains rectifier diodes. The resulting hum modulated signal then escapes by the reverse path of how it entered the power supply. Regulated power supply action may malfunction should RF be conducted into the circuit via AC or DC power leads. General treatment for HF EMC problems is to use 0.01 uF disc ceramic capacitors to "bypass" all leads and semiconductors, but of course they should be checked for not slowing down the response of electronic voltage regulators being able to follow variations in current drawn from the supply. VHF EMC problems should be treated with lower value "bypass" capacitors, or even metal shields. Do not skimp on safety ratings with capacitors used on mains leads (if a capacitor is not marked as being 230 V AC mains rated, then do not use it on mains wiring). Winding AC or DC leads on ferrite toroids can also be effective at reducing RF getting into a power supply or into equipment connected to the power supply.

Hum loops can be a problem when several separate pieces of equipment are connected up, as the grounded conductors in connecting leads provide a web of paths in which earth return current is able to flow. Power supply currents sharing conductors with low level audio signals is a recipe for coupling unwanted hum and noise to the audio feed. A very effective way of controlling power supply hum loops is by using split bobbin power transformers and two wire mains leads. A *split bobbin* transformer with a double insulated rating is legally able to be used with no earth wire, thus a potential hum loop via the mains earth is entirely avoided (for safety reasons this is *not* a technique to try with other than the proper rated split bobbin type of transformer). An isolation transformer in series with an existing power cord can be used with equipment that does not have a split bobbin transformer in its power supply. Isolation transformers have highest isolation at lower frequencies, and are limited by primary to secondary coupling capacitance in restraining higher frequencies from "jumping" the windings.

Switch mode power supplies may give high efficiencies and small package size, but there are inevitably "hash problems" for lower bands and harmonics of the switching rate to spot frequencies in several bands. One innovation in a commercial switch mode power supply is to have a front panel "tuning knob" so the switching rate can be optimised for minimal interference falling on a given working frequency (and needs readjusting as appropriate). Having a tuning knob does nothing to reduce the generation of hash or harmonics but arranges for them to be steered to least harmful spots on the dial.

Limitations of inductors

High frequency inductors are sometimes rated by the manufacturer for operation over a specified frequency range. This is a realistic reflection that unavoidable interwinding capacitance results in self-resonance at some relatively high frequency, and also for losses in core or coil former material. For frequencies above self-resonance the "inductor" appears to behave more like a capacitor, and explains why some filters may not deliver the expected results at higher frequencies. What is intended on a circuit diagram and what happens to an installed inductor may not achieve the intended result. Inductors need to be carefully selected if wideband performance is sought.

Limitations of capacitors

Capacitors also become self-resonant at some high frequency, when resonance occurs with unavoidable inductance of the leads and body. All lengths of conductor have some inductance, so it is impossible to build a perfect capacitor that would work at any frequency. However, capacitors are generally useful over a much wider frequency range than is the case for inductors. Disc ceramic capacitors are generally the best all round performers for HF and VHF work. The rated upper frequency range of mains bypass capacitors is sometimes no more than a few megahertz. Polystyrene or polypropylene capacitors are generally the lowest loss type of capacitor in the audio and lower frequency bands.

Ferrite and powdered iron components

There are many types of ferrite and powdered iron cores, and care is needed to end up with an appropriate type for a given application. There is quite a difference between selecting a core for a low loss RF transformer and using a core to attenuate unwanted RF signals. Transformer cores working at signal frequencies generally require selection of a given type of core material that has low loss in the frequency bands of interest, especially where RF power is involved. With tuned transformers, high Q mode of operation is possible. However, for EMC applications ferrite material is generally selected as being well above the frequency range that it would be used as a transformer core, as low Q absorptive mode of operation usually gives best EMC performance. A low Q choke is like having an inductively coupled series resistor in the circuit.

Split-core ferrites can easily be fitted over existing wiring, and can effectively add a series impedance to higher frequency signals in the wiring. Split-core ferrites are widely

used commercially, for the likes of reducing radiated noise from computer cables (especially in the VHF television bands). The split core (when fitted properly over a wire or cable) is equivalent to a one turn inductor with a toroid core, so not unexpectedly has fairly low impedance at lower frequencies, so does little to reduce conducted noise that happens to fall in the 160 or 80 m amateur bands. Several turns on a high permeability core are needed for there to be useful attenuation in the MF and lower HF bands.

While ferrite material usually has a much higher permeability than powdered iron, it generally does not have the good power and linearity ratings that are available with powdered iron. Powdered iron is a core material widely used for inductors in transmitter output filters, and most of these are in toroid (ring) form. Toroid cores are ideal for keeping most of the magnetic flux within a closed path (around the toroid) which not only leads to fewer turns for a required value of inductance (thus higher Q) but also minimises the flux that possibly links with other circuits. Flux leakage can lead to EMC problems.

Powdered iron cores are colour-coded as to recommended frequency bands, and care should be taken to select the right material and core size (power rating) to do the intended job. Any core that runs into saturation can worsen rather than improve the signal quality being applied to what is hoped to be a filter (saturating cores are similar in effect to peak clipping in amplifiers, so core saturation is obviously a situation to be entirely avoided in a filter circuit).

Telephones

Telephones are not intended to be used for RF modulation monitoring, but unfortunately too many of the newer types of electronic telephone have poor rejection of RF. *There are so many types of telephone on sale these days that it is impractical to offer advice other than "buyer beware". Telecom rental telephones (identifiable by a Rentel type number) of recent times have been developed with RF immunity as one of the performance considerations.*

Controlling RF pickup in audio amplifiers

The input stages of audio amplifiers can act as crystal sets and detect RF that happens to arrive with good level at the input device. The detected parts of the RF envelope that are in the audio range can thus be amplified by subsequent audio stages. A useful way of reducing RF arriving at the first audio stage is to use a series resistor followed by a parallel capacitor to equipment chassis (local earth). A resistor of a few hundred ohms (but could be as much as 10 per cent of the amplifier input resistance) and a capacitor of a few hundred picofarads (but with a reactance that does not significantly reduce the level of the highest audio frequencies) can be very effective at controlling RF breakthrough. A suitable value series resistor is considered to be a more consistent performer than an RF choke (RFC). This is because the resistor retains its effectiveness over a very wide bandwidth, whereas the RFC may offer too little reactance to be effective at lower frequencies and become self-resonant below the desired upper frequency limit of operation.

Speaker leads also act as unintended aerials. RF pickup in the amplifier can be reduced by winding the speaker leads on a ferrite rod or ferrite toroid (this of course uses up some of the length of the speaker lead).

Computers and amateur radio

Many amateur operators use a computer in the shack. The computer motherboard involves a myriad of high speed digital signals for clocking and data processing, so there is usually very high potential for interference to be experienced by a nearby radio receiver. The power cord, keyboard cable, printer cable, mouse cable, monitor cable and COM port cables are also possible ways that "computer hash" can escape. The computer monitor (CRT screen) necessarily has magnetic deflection fields that do not stop at the outside of the monitor enclosure, and high bandwidth video drive signals may also be noticed on nearby radio receivers. Nearly all computers and monitors use switchmode power supplies, which can also be "hash generators" from a radio perspective.

Before considering purchase, look for FCC or CE markings or stickers on computers, or otherwise confirm compliance with known EMC standards. Taming interference within a computer is beyond the scope of these summary notes, and likely beyond the scope of any warranty offered on a computer. Having a portable radio with frequency coverage on bands of interest is one way of evaluating relative interference in a shop situation. Listening out on AM is much more informative than receiving on FM mode, and having an analogue S meter is useful for comparing levels. Some computers are quite acceptable for running in the shack alongside radio equipment. However, a "bad" computer can be an irritation to receiving weaker radio signals, even if it is used elsewhere in the household.

Split core ferrites are widely used for controlling unwanted signals on cables attached to a computer. Many computers have these already fitted to cables. For radio data modes such as RTTY, packet, AMTOR or PACTOR, it can be useful to deploy a "braid breaker" to isolate the computer from the TNC or radio, using optoisolators for PTT or data, and using telephone style 1:1 transformers for audio. An external mains filter can likely reduce unwanted signals that otherwise escape via mains wiring.

A laptop PC can have a very low level of radio noise as its LCD display does not need a high voltage switch mode power supply or magnetic deflection from sweep circuitry. Beware that the mains power supply can be the worst interference generator in a laptop PC setup, and if the power supply is external it can be replaced by a low noise linear regulated power supply with the same DC output.

AMATEUR RADIO RECORDS

by JOHN WYSOCKI ZL2TWS

New Zealand VHF/UHF/SHF records 1999

Band	Frequency	Type	Stations	Date	Mode	Distance (km)
6 m	50 MHz	Overseas	ZL3NE-VE1AVX	16/11/1980	SSB	15,555
6 m	50 MHz	E-M-E	ZL2BGJ-WA4NJP	08/09/1988	CW	13,256
2 m	144 MHz	Internal	ZL2ARW/p-ZL1BJB/p	03/02/1982	SSB	1,069
2 m	144 MHz	Overseas	ZL1HH-VK5ZEE	15/01/1986	SSB	3,420
2 m	144 MHz	E-M-E	ZL2BGJ-G3POI	26/05/1985	CW	18,821
70 cm	432 MHz	Internal	ZL2ARW/p-ZL1BJB/p	03/02/1982	SSB	1,069
70 cm	432 MHz	Overseas	ZL2TPY-VK4ZSH/p	13/01/1988	SSB	2,405
70 cm	432 MHz	E-M-E	ZL3AAD-F9FT	18/05/1980	CW	18,793
70 cm	425 MHz	Internal	ZL2TWS/p-ZL2ASF/p	31/01/1982	Video	373
50 cm	610 MHz	Internal	ZL2UGR/p-ZL2AJI/p	23/04/1988	SSB/FM	302
32 cm	925 MHz	Internal	ZL3VTV/p-ZL1AVZ/p	06/12/1998	SSB/FM	154
23 cm	1296 MHz	Internal	ZL2ARW/p-ZL1THG/p	30/01/1982	SSB	687
23 cm	1296 MHz	Overseas	ZL1AVZ-VK2BDN	09/02/1982	SSB	2,131
23 cm	1296 MHz	E-M-E	ZL3AAD-PAØSSB	13/06/1983	CW	18,657
13 cm	2304 MHz	Internal	ZL2ARW/p-ZL1THG/p	31/01/1982	NBFM	687
13 cm	2304 MHz	E-M-E	ZL2AQE-W3IWI/8	18/10/1987	CW	13,931
9 cm	3456 MHz	Internal	ZL2AQE/p-ZL2ARW/p	06/03/1983	NBFM	547
5 cm	5760 MHz	Internal	ZL2AQE/p-ZL2ARW/p	29/01/1983	NBFM	225
3 cm	10000 MHz	Internal	ZL1THG/p-ZL2BFC/p	25/01/1981	WBFM	390
1 cm	24000 MHz	Internal	ZL2AQE/p-ZL2AZQ/p	20/03/1988	MCW	126

Notes

1. New Zealand 70 cm band has now been reduced from 420–450 MHz to 430–450 MHz. The Video (TV) record of 31/01/1982 on 425 MHz stays as a 70 cm record.

2. New Zealand 13 cm band has now been reduced from 2300–2450 MHz to 2396 MHz–2450 MHz. The records of 31/01/1982 and 18/10/1987 stay as a 13 cm record.

3. New Zealand 50 cm band has now been reduced and changed from 610–620 MHz to 614–622 MHz. The record of 23/04/1988 stays as a 50 cm record.

4 ./p means portable operation.

5. /# means operating in another state or district.

AREC AMATEUR RADIO EMERGENCY COMMUNICATIONS

MISSION STATEMENT

To be the preferred provider of emergency communications to New Zealand Emergency Services.

The AREC was formed in 1932 following a devastating earthquake in Napier. Today, the AREC consists of 74 Sections throughout New Zealand, each with its own Section Leader who is responsible for the training and conduct of the Section. Each Section is attached to a Branch or Branches of NZART, from where members are drawn.

Management of the AREC is vested in a National Director who is appointed by NZART Council. The National Director likewise appoints a Deputy, Secretary and a Manager for the four districts. These seven people form the AREC Management Group.

The current objectives are:

★ To train and provide communications personnel, skilled in assisting organizations during emergencies.

★ Maintain a close liaison with the New Zealand Police for Search and Rescue.

★ Maintain a close liaison with Civil Defence.

★ Maintain a liaison with community organizations.

★ Provide and maintain equipment appropriate for emergency operations.

National Director AREC controls the issue of AREC Station Identifiers, formally known as call-signs and issued by the RFS. AREC Sections are listed in this publication, in identifier order, along with their Section Leaders and Deputies. The Section Identifier, in its basic two letter form, is issued to the Sections' Leaders for their use only. AREC Station Identifiers for Section use are then issued by the Section Leader for that operation/exercise, with the following being normally reserved:

"A" = Section Base Station
"B" = Section Field Headquarters
"C" = Section Relay Station

AREC operators engaged in SAR activities and operating on SAR frequencies are to use the call-sign allocated for that operation/exercise. This call-sign is to reflect the geographical location of the search area. Civil Defence's radio call-signs are controlled by the CD organization.

AREC emergency frequencies

The following frequencies are reserved for AREC use in emergencies:

1875–1900 kHz
3500 and 3900 kHz
7100 kHz
2 m and 70 cm repeaters

The general calling frequencies for AREC stations requiring assistance in emergencies are, 3900 kHz USB or local repeaters and these frequencies are normally monitored by AREC personnel during events such as storms, earthquakes and other significant events that could give rise to emergencies.

AREC Sections' Net

A monthly net is held on 3900 kHz USB at 1930 hours NZST on the third Monday of each month except December. This net uses the AREC Identifier of ZL6E, the AREC master station and is conducted as a contact net for those Sections wishing to seek information or report activities of an AREC nature.

Be prepared for an emergency—What to do—Some suggestions

As an Amateur Radio Operator, who may become involved with an emergency of some kind and having access to assistance via radio could provide timely intervention to those in distress. Preparations for such an eventuality would be good planning and the following suggestions are offered.

1. Be familiar with your local repeater services and frequencies, with a knowledge of the service area.

2. In the event of an SAR requirement, contact your nearest Police station, they will activate their system.

3. For Civil Defence requirements, contact either your Regional or District Councils.

4. Be familiar with your AREC representatives or Club officials, keep a list in the house and car.

5. Use the AREC call frequencies or break-in on any net and identify yourself and the emergency at hand.

When making a call for assistance, by radio, ensure that all the vital details concerning the emergency are passed to the station that is contact the emergency services, this will enable a more appropriate response.

Police, Fire, Ambulance check list

Type of incident

Road accident—type and number of vehicles involved.

—Number and extent of injured or trapped persons.

Type of medical emergency—heart attack, electrocution, etc.

What is on fire—car, building, stove, etc.

Kind of accident—car/truck, car/person, motorcyclist etc.

Hazardous chemicals involved—gases, liquids, fuel, etc.

Location of accident

Street or road name and number, rural number, highway number.

Cross street or road reference.

Suburb and city or town.

Any other geographical detail to clarify location.

Other information

Vehicle registration number—burglar, hit and run, etc.

Description of people—clothing, height, race.

Direction of travel.

(If you are making a telephone call to the emergency services, make sure the above information is gained from the person on the radio before making the 111 call.)

Marine distress call

Intercepting a "MAYDAY" call, briefly listen to see if any other station is responding, then endeavour to contact the distressed vessel on the frequency and mode they are using. Do not get them to change frequency. Ask for details of the distress and write down the details given.

Essential information

Where

Position, latitude and longitude, GPS information, any bearing and distance from geographical feature or place.

What

What is the nature of the distress?

What help is required?

What battery life or restrictions are on radio use?

What lifesaving equipment is on the vessel?

Has an EPIRB been activated?

What is the weather at the distress position?

Who

Description of distressed vessel, name, registration and size.

How many people in distress and their ages.

Colour of vessel and distinguishing marks.

Also record the time and frequency of the distress call. If practical get another person to telephone in the information and stay on the frequency to gather other essential information. Tell the operator what assistance you are giving to help them.

Desirable information

Voyage details

Departed time, date, destination. Last known exact fix, if position unsure.

Medical details

Any specific medical needs or conditions?

Extent of injuries.

Safety equipment

Food and water available.

Other types of radio equipment, VHF, HF.

Flares and types available.

The station called Mayday, in fact, might not hear you calling because of propagation or other factors, but continue to listen, they could transmit their position details blindly. Regardless, report the distress call to the coast guard or Taupo Marine Radio stating the time and frequency, when first heard and any other details of the signal, background noises or how genuine it sounds.

Earthquake

In the event of a moderate or greater earthquake felt in your location, your assistance, through AREC, could be valuable to Civil Defence. Switch to your local VHF repeater and monitor for activity about the event. An AREC station may be requesting reports from stations on what has occurred in their locality. AREC will be gathering this information to put together a "Felt Report" (refer to Earthquake Reporting). This information is then relayed to Civil Defence to help them access the extent of damage that may have resulted.

Apart from estimating the intensity of the earthquake, any information about the state of the utility services and any other significant details known about your surroundings will be useful.

EARTHQUAKE REPORTING
THE MODIFIED MERCALLI SCALE OF INTENSITY OF EARTHQUAKES

Introduction

The severity of an earthquake can be expressed in two terms, namely intensity and magnitude. These two terms are different and are often confused.

Intensity is based on the effects of ground shaking on people, buildings, contents and natural surroundings and varies from place to place within the disturbed region. This observed effect depends on the location of the observer with respect to the earthquake epicentre (location within the earth's crust where the movement occurred).

Magnitude is related to the amount of seismic energy released at the hypocentre (point on the earth's surface directly above the earth movement). This measurement is made by and recorded on instruments (Seismograph) that have a common calibration, thus magnitude is determined instrumentally and uses the Richter Scale to indicate the magnitude. The Richter Scale bears little resemblance to how people perceive the intensity of an earthquake, thus the "Modified Mercalli Scale of Intensity" is measurable by people.

This scale is based on certain key responses being felt or observed by people who can then grade the intensity using this scale, and communicate this to others. When reporting an earthquake you should use this scale to convey the effects that had been felt in your location. When a number of reports are collected from an area and assembled in one place, a summary of this information then becomes known as a Felt Report (indicating the extent of the area it was felt over and what intensities were experienced).

Modified Mercalli Scale of Intensity

MM1

Not felt by humans, except in especially favourable circumstances, but birds and animals may be disturbed. Reported mainly from upper floors of buildings more than 10 storeys high. Tree branches, chandeliers, doors and other suspended systems of long natural period may be seen to move slowly. Water in ponds, lakes, reservoirs etc may be set into seiche oscillation.

MM2

Felt by people at rest indoors, especially by those on upper floors or otherwise favourably placed. The long period effects listed in MM1 may be more noticeable.

MM3

Felt indoors, but not immediately identified as an earthquake by most Vibrations may be likened to the passing of a truck. It may be possible to estimate the duration, but not the direction. Hanging objects may swing slightly.

MM4

Generally noticed indoors, but rarely outdoors. Light sleepers may be awakened. Vibrations may be likened to passing heavy traffic, or to the jolt of a heavy object falling or striking the building. Walls and frame of building are heard to creak. Doors and windows rattle, liquids in open vessels may be slightly disturbed. Standing motor cars may rock, and the shock can be felt by their occupants.

MM5

Generally felt outside, and by most indoors. Most sleepers awakened. A few people frightened. Direction and motion can be estimated. Small unstable objects may be displaced or upset. Some glasses and crockery may be broken. Some large windows cracked/damaged. Hanging pictures move. Doors and shutters may swing. Pendulum clocks are affected.

MM6

Felt by all. People and animals alarmed. Many run outside. Difficulty experienced in walking steadily. Slight damage to masonry "D". Some plaster cracks or falls. Isolated cases of chimney damage. Windows, glassware and crockery broken. Object fall from shelves, pictures from walls. Heavy furniture moved. Unstable furniture overturned. Small church and school bells ring. Trees and bushes shake, or are heard to rustle. Loose material may be dislodged from existing slips, talus slopes or shingle slides.

MM7

General alarm of people and animals. Difficulty experienced in standing. Noticed by drivers of motorcars. Trees and bushes strongly shaken. Large bells right. Masonry "D" cracked and damaged. A few instances of damage to masonry "C". Loose brick and tiles dislodged. Unbraced parapets and architectural ornaments may fall. Stone walls cracked, weak chimneys broken, usually at the roof line. Domestic water tanks burst. Waves seen on ponds and lakes. Water made turbid by stirred up mud. Small slips, caving in of sand and gravel banks.

MM8

Alarm may approach panic. Steering of motorcars affected. Masonry "C" damaged with partial collapse. Masonry "B" damaged in some cases. Chimneys, factory stacks, monuments, towers and elevated tanks twisted or collapsed. Panel walls thrown out of frame structure. Some brick veneers damaged. Decayed wooden piles broken. Frame houses not secured to foundations may move. Cracks appear on steep slopes and in wet ground. Landslips in roadside cuttings and unsupported excavations. Some tree branches may be broken off. Changes in the flow or temperature of springs and wells may occur. Small earthquake fountains (fissures).

MM9

General panic. Masonry "D" destroyed, masonry "C" heavily damaged, sometimes collapsing completely, masonry "B" seriously damaged. Frame structures raked and distorted. Damage to foundations generally. Frame houses not secured to foundations shifted off. Brick veneers fall and expose frames. Cracking of ground conspicuous. Minor damage to paths and roadways. Sand and mud ejected in elevated areas, with the formation of fissures and sand craters. Underground pipes broken. Serious damage to reservoirs.

MM10

Widespread panic. Most masonry structures destroyed, together with their foundations. Some well-built buildings and bridges damaged. Dams, dykes and embankments seriously damaged. Railway lines slightly bent. Concrete and asphalt roads and pavements badly cracked or thrown into waves. Large landslides on river banks and steep coats. Sand and mud on beaches and flat land moved horizontally. Large and spectacular sand and mud fissures. Water from rivers, lakes and canals thrown up on banks.

MM11

Wooden frame structures destroyed. Great damage to railway lines and underground pipes.

MM12

Damage virtually total. Practically all works of construction destroyed or greatly damaged. Large rock masses displaced. Line of sight and level distorted. Visual wave motion of the ground surface reported. Objects thrown upward into the air.

Masonry categories

"A"

Structures designed to resist lateral forces of about 0.1g that satisfy the New Zealand building code 1955. Typically, well reinforced ferro-concrete. All mortar is in good condition and the design and workmanship is good. Few buildings erected prior to 1955 can be regarded as category A.

"B"

Reinforced buildings of good workmanship and with sound mortar, but not designed in detail to resist lateral forces.

"C"

Buildings of ordinary workmanship, with mortar of average quality. No extreme weakness, but neither designed nor reinforced to resist later forces.

"D"

Buildings of low standards of workmanship, poor mortar or constructed of weak materials like mud brick and rammed earth. Weak horizontally.

The R-S-T System

Readability

1—Unreadable.
2—Barely readable, some words distinguishable.
3—Readable with considerable difficulty.
4—Readable with practically no difficulty.
5—Perfectly readable.

Signal Strength

1—Faint signals barely perceptible.
2—Very weak signals.
3—Weak signals.
4—Fair signals.
5—Fairly good signals.
6—Good signals.
7—Moderately strong signals.
8—Strong signals
9—Extremely strong signals.

Tone

1—Harsh, broad hiss, no perceptible tone.
2—Harsh, broad hiss, just perceptible tone.
3—Harsh, broad non-sinusoidal tone.
4—Harsh, broad tone, badly hum-modulated.
5—Poor sinewave, badly hum-modulated.
6—Good sinewave, pronounced hum modulation.
7—Good sinewave, definite hum modulation.
8—Excellent sinewave, just perceptible hum modulation.
9—Perfect sinewave.

The "tone" scale is used for reporting the amount of hum on a CW signal. If the signal has chirp, the letter "C" can be appended. If the signal has key-clicks, the letter "K" can be appended. Most of the signals you hear will be T9.

compiled by
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ZL1BPU

To many Amateurs, Digital Modes are another world that they would prefer not to contemplate, since it is expected to be difficult and expensive to get involved, requiring extensive computer skills, and lacking in interesting live contacts with other Amateurs. This is however not true at all, especially now. Use of Digital Modes, particularly HF Digital Modes, for real-time contacts is growing tremendously. Some of the newly developed modes are now in widespread use—PSK-31 especially. VHF operation is mostly limited to packet operation with bulletin boards, and therefore more a "tool" than a means of communication, although some of the data modes—especially SSTV, PSK-31 and Hellschreiber—are ideally suited to VHF. Use of VHF packet activity has dropped markedly since the internet took over most of the email, but the HF "chat" modes are more popular than ever.

Digital modes make use of some type of on-off keying to send data as "0"s and "1"s. For example, RTTY uses Frequency Shift Keying (FSK), sending "0"s on one frequency, and "1"s on another. Morse and Hellschreiber send dots as carrier, and gaps between dots as no carrier. PSK-31 sends "0"s and "1"s by switching the carrier phase, which you can imagine is the same as swapping the leads to the antenna at the data rate.

Most digital modes use a coding system, which means that the letters and numbers (or voice sounds or picture colours) are represented by a number, which is transmitted as "0"s and "1"s. This improves the efficiency, but reduces the resistance to errors. RTTY (which uses the CCITT International Alphabet ITA2), PSK-31 (which uses the G3PLX Varicode), Pactor (which uses ASCII, also known as ITA5) and digital voice (using a vocoder) are examples of coded modes. FAX, SSTV, and Hellschreiber are examples of uncoded modes.

Many of the newer modes use an error correction system to ensure that the data arrives intact despite problems in the propagation path. This error correction takes one of two forms—Automatic ReQuest repeat (ARQ) or Forward Error Correction (FEC). Some modes even use a combination of FEC and ARQ.

ARQ requires a two-directional link, where each "packet" or block of data received is checked for errors and a request for repeat transmitted back if necessary. These modes are characterised by alternate brief transmissions from each end of the link, and are not suited to broadcast or net operation. Examples are Pactor and VHF Packet.

FEC has the advantage that the information to reconstruct the data is transmitted along with the data, so no repeats are required. This is better for net operation. Some FEC types are extremely robust. Uncoded modes do not need or use error correction, as they are generally robust by nature; in other words an error is seen as a blemish, rather than a completely different image, character or sound.

Digital mode software

Many of the Digital Modes discussed below can be operated with nothing more than a PC with a sound card, with very high performance. The sound card is used to send and receive audio tones which are used with an SSB transceiver. See reference[1] for details of a freely available Guide to PC Modes. All the software mentioned in the Guide is freely available on the internet, and links to the software are provided. Other modes, such as Pactor and VHF packet, typically require an external module, either a modem or a modem and controller combination called a "TNC" (terminal node controller).

Baud, bps and wpm

The Baud rate of a digital transmission is the rate in Hz at which the basic data symbols are switched on the transmitted signal. For example, RTTY operates at 45.45 baud. The bit rate, in Bits Per Second (bps), is the actual data rate entering or leaving the modem. For various reasons (compression, use of multiple carriers etc.) this may well exceed the baud rate. For example, MT63 has 64 carriers, and achieves 640 bps at only 10 baud. The text transmission rate in Words Per Minute (wpm) depends on how many bits there are per character (there are on average six characters per word, including a word space). For example, 45.45 baud RTTY is 45.45 bps and since there are 7.5 bits per character, operates at 6 characters/sec or 60 wpm. PSK-31 operates at 31.25 baud and achieves about 50 wpm. Feld-Hell operates at 122.5 baud, uses up to 49 bits per character, and is capable of about 30 wpm.

RTTY

The first digital mode to see widespread use in Amateur circles (after Morse, that is), RTTY (Radio Teletype) is a conversational or "chat" mode, and uses the ITA2 code to send a limited text alphabet, using frequency shift keying. Two tones are used, 170 Hz apart for Amateur applications. The transmission is about 450 Hz wide. Most Amateur operation is at 45.45 baud, while commercial services tend to be 50 or 75 baud. RTTY still has a wide following, and is a favourite for contests.

Perhaps the nicest sound card RTTY software is TrueTTY by Sergei UA9OSV. It has an excellent FFT tuning indicator and all the features one needs for simple yet slick conversations and even contests. It will operate all the common speeds and all the common shifts, and even operates PSK-31 in BPSK mode.

AMTOR

AMTOR is rather like RTTY, but includes extra data to enable some errors to be detected. It operates at 100 baud, but the actual text throughput is the same as 50 baud RTTY. It was developed from the commercial SITOR system by Peter Martinez G3PLX. Most AMTOR operation is ARQ, and is characterised by very short transmissions (about one second). AMTOR FEC is useful for bulletin broadcast and is used to call CQ. AMTOR is now very little used.

PSK-31

PSK-31 was developed recently as an RTTY replacement. It is a slick "chat" mode, but is much more sensitive than RTTY, and uses less bandwidth than almost any other mode. Designed by Pawel SP9VRC and Peter G3PLX, PSK-31 uses differential phase shift keying (BPSK or QPSK). Just one tone is used. In BPSK mode the data is transmitted without error correction, while in QPSK mode each symbol represents two bits, allowing a powerful FEC error correction technique to operate. The bandwidth is a mere 60 Hz.

PSK-31 is very popular, now more than RTTY, and has proved to be excellent for HF and VHF DX. It is not well suited to transpolar paths (like long path to Europe) as it is susceptible to ionospheric flutter due to the narrow bandwidth. It copes well with adjacent signals, fading and multipath reception, and it is not unusual to work stations you cannot hear. Because of the sensitivity, low power is all that is needed.

There is a wide range of PC software for PSK-31,[2] from the simple G3PLX program PSK-31 SBW upwards. A good program to get started with is DIGIPAN, which has much simplified tuning requirements, and "point and click" netting.

MT63

MT63 is an amazing new mode that would not be possible without Digital Signal Processing. Sixty-four PSK carriers are transmitted all at once, each one carrying a different part of the transmitted signal. The data (which includes strong FEC) is spread across the width of the signal (typically 1 kHz), and also spread in time (typically 6.4 seconds), so MT63 is resistant to both time and frequency related interference.

The PC version by Nino IZ8BLY is simple to use, easy to tune, locks in to the signal effortlessly, and is extremely robust. It is very sensitive, and excellent for DX under poor conditions. Unfortunately MT63 is rather wide, and very aggressive (causes interference but is not much affected by interference), so needs to be used with care. MT63 is an excellent mode for transmitting bulletins.

Hellschreiber

Hellschreiber almost became a lost art, but is undergoing enthusiastic revival. Text and simple graphic symbols are transmitted uncoded, rather like sending the dots to a dot matrix printer. Because the signal has very high peak power compared with the average, and is interpreted by eye rather than by electronics, the mode is very noise immune and requires little power. It is also immune to most ionospheric effects. Since tuning is broad, it is simple to use, ideal for HF and for satellite working.

There are several Hell modes in general use, and more under development. Hellschreiber has a special appeal that occurs with no other mode except Morse—there is an immense "feel" that the operator has for the propagation of the arriving signal, and the uniquely recognisable "fist" (in this case "font") of the transmission. The user can choose any one of many fonts to transmit (even "Windows" fonts), and the data rate, typically 122.5 baud, provides a good 25–30 wpm typing speed, depending on the font used. Big black fonts are best for DX, but tend to be slower.

The most commonly used mode is Feld-Hell, an on-off keyed CW mode which dates from the 1940s. Invented by Rudolf Hell, Feld-Hell

uses a single 980 Hz tone. It is the ideal mode for 20 m, and performs well on other bands, satellites and moon-bounce. Feld-Hell is used for most Hell DX.

The most sensitive Hell modes are PSK-Hell and FM-Hell, invented by Murray ZL1BPU and Nino IZ8BLY, which transmit the dots as phase reversals for white and no reversal for black. PSK-Hell uses sinewave envelope phase modulation, and has two keying sidebands, while FM-Hell uses continuous phase FSK and has only one sideband. These are the best DX modes, are very sensitive and not affected by ionospheric flutter in the way PSK-31 is. Great for VHF DX too, as these modes are easy to tune and tolerant of drift. FM-Hell does not require a linear transmitter.

Duplo-Hell is a good candidate for 80 m, and other bands where noise and multi-path reception are the biggest problems. Duplo, invented by Nino IZ8BLY, uses two tones at 980 and 1225 Hz to achieve normal Hell speed, while using slower dots to reduce noise and multi-path echoes. It is not difficult to work VK on 80 m using Duplo-Hell.

The best Hell software is IZ8BLY Hellschreiber.[3] It operates seven Hell modes, includes a very good tuning display, and all the features necessary for good DX. It is really simple to install and use.

Fax and SSTV

These modes can also be operated with nothing more than a PC with sound card. Fax is very rarely transmitted on Amateur bands, although there is wide interest in receiving weather maps on HF (black and white) and weather satellite images (greyscale) on VHF. Both of these modes are straightforward with software like Christian Bock's WXSAT program. The resolution produced by this software is incredible. On satellite pictures it is often posible to identify the South Island lakes, or puffs of steam from White Island.

SSTV is a great way to share photographs, graphics and simple drawings with friends. The resolution is not very high, but the colour depth is good and the image content is restricted only by imagination and good taste. Start with one of the commercial PC shareware programs, such as W95SSTV or Chromapix. It helps if you have a scanner, digital camera or a good collection of digital images to send. SSTV is typically used to add interest to an SSB contact, and is also used on VHF FM, where picture quality is excellent.

PACTOR

A cross between Packet and AMTOR, PACTOR is an FSK system which provides strong error detection and ASCII text with an ARQ format. Efficiency is improved by a clever system where repeated damaged blocks of data are averaged until the check-sum is met, so one complete error-free block is not actually required for correct reception. Many of the newer HF multi-mode controllers offer PACTOR, and there are some applications for PC or other processor and external modem. At least one PC sound card receive-only program is available. Pactor operates at 100 or 200 baud, and switches between speeds as conditions permit.

PACTOR is very popular for bulletin board use, but it is rare to have a conventional contact using PACTOR. There are many Bulletin Board Stations (BBS) available on HF, some with connections to the Amateur Packet network, some even with internet connection for mail forwarding. PACTOR is also used commercially.

The WINLINK stations, for example, are fixed mail store-and-forward stations based around the world, with connection to the internet. Most stations operate PACTOR or PACTOR II, and each station has a frequency list that it scans every few seconds. These frequencies are mostly on 40, 30, and 20 m. These stations provide a service to marine and other mobile or portable operators, who estimate which band will provide propagation to the BBS station and call on one of the published frequencies. Once connected, the BBS controls operation just like a Packet system, and allows messages to be sent via the Amateur and Internet networks. Windows software is available to operate these links.[4]

Commercial modes

Some of the newer HF digital modes are only available with expensive commercial hardware. These include PACTOR II, GTOR and CLOVER. Unfortunately these modes are proprietary, so their use is not widespread.

PACTOR II is the most widely used of these modes, as it is compatible with the older PACTOR I and supported by many BBS. PACTOR II uses two carriers and operates at 100 or 200 baud, using various PSK techniques to achieve data rates as high as 800 bps with excellent sensitivity. It is an ARQ system just like PACTOR I.

GTOR is an adaptable ARQ system similar to PACTOR II, but includes a Golay error correction system and can operate at 300 baud. CLOVER is another adaptable ARQ system, but with four carriers and a selection of PSK modes. All these systems use compression techniques and can transfer binary files, but they are not able to operate with each other.

Operating frequencies

Narrow band modes (RTTY, PSK-31) are to be found at the lower end of the digital allocation on each Amateur band, for example on 20 m from 14.070 to 14.099 MHz. Wider modes and the BBSs are found at the upper end of the allocation, for example on 20 m from 14.101 to 14.130 MHz. On-off keyed modes such as Hellschreiber are found just below the digital mode boundary, for example at 14.063–14.065 MHz. MT63 is found at 14.347 MHz USB (Europe) and around 14.114 MHz.

Calling frequencies

RTTY

3.545 MHz (mark carrier)
7.045 MHz (mark carrier)

Hell

3.559 MHz (carrier)
10.135 MHz (carrier)
14.063 MHz (carrier)

Frequencies for most digital modes are usually quoted as the frequency the transmitter emits when idle. For RTTY this is the mark frequency—for Morse, PSK-31 and Hellschreiber the carrier frequency, or lower tone frequency. However for complex modes like MT63 and SSTV, the frequency indicated on the transceiver display is frequently used, since the tones transmitted and the sideband used are fixed by convention.

Packet radio

Packet radio utilizes a protocol known as AX-25, which defines an automatic system to transmit blocks of information (called packets) which include the data, message type, information as to who the data is addressed to and from, and a strong error detection system called a Cyclic Redundancy Check (CRC).

Packet radio is organised so that many stations can operate on the same frequency with limited interference. This technique is called Carrier Sense Multiple Access/ Collision Avoidance (CSMA/CA), which means that stations listen for other signals before transmitting to avoid collision, but cannot guarantee not to cause interference to stations that cannot be heard. This situation frequently happens when stations on opposite sides of town share a BBS station.

Most, but not all packets require acknowledgement (an ACK), and the sender will repeat the packet until a correct acknowledgement is received. This technique ensures that the data is received correctly and compensates for collisions and errors, but as the channel activity increases, the useful data rate slows down significantly as more and more time is spent correcting and sending requests for repeats (Negative Acknowledgements, or NACKs).

There is a special family of unacknowledged messages called an Unconnected Information (UI) packet that is widely used for beacon messages and the Automatic Position Reporting System (APRS) developed by Bob Bruniga WB4APR.[5]

The most common Packet format is 1200 baud AFSK using an FM transmitter. Faster systems, to 9600 baud and beyond, are finding increasing use, especially for satellite forwarding and dedicated links.

Most packet operation in New Zealand is on VHF or UHF—144.650, 144.675, 147.500 MHz, and 432.650, 432.675 and 438.300 MHz, using narrow band FM.

Packet BBS operation

There are many packet BBS stations in New Zealand, most with 2 m access, and many with 70 cm access. If you call them and connect, sending an "H" command will give you a list of commands to which the BBS responds. The list of commands and facilities on most BBS setups is extensive, but simpler functions like listing and reading messages, reading and sending mail, are simple and easily learned. Packet messages, either for general distribution (bulletins) or personal delivery (e-mails) are forwarded automatically between the BBS stations. ZL2WA acts as the "hub" for message distribution, and handles all the traffic in and out of New Zealand, using HF and satellite gateways. Most of the forwarding within New Zealand takes place overnight, using the National System on 70cm.

Provided you know the Packet e-mail address of the recipient, usually in the form callsign@ bbscallsign, then using a BBS to send an email is generally as simple as typing:

SP ZL3ABC@ZL3AC

and then typing the message. Sending mail overseas is not much more difficult—you simply use an extended address form, such as:

SP G3ABC @ GB7BBS.#28.GBR.EU

where the longer address specifies the region and country as well as the home BBS of the recipient.

Data repeaters

To enhance the range and utility of packet radio, it is relatively easy to arrange for packet systems to repeat or forward data. In fact any packet station can act as a data repeater (called a "digipeater"). Unfortunately there is an extra delay in every digipeater that the data passes through, and unless the input and output is on a different frequency (called a "gateway"), there is also extra traffic on the radio channel, slowing down the throughput.

One answer is to use a hill-top data repeater, which is similar to a VHF voice repeater, but usually decodes and remodulates the digital data to clean up the signal. There is much less delay than with a digipeater, and of course the input and output are on different frequencies. Data repeaters are listed in the Call Book "Repeaters and Beacons" section.

An even better idea is to send the data to some remote point using a high speed link (UHF link, landline or even the internet). These techniques are used to connect BBS systems together for forwarding mail.

References

(1) "Amateur Radio Modes Using the PC Sound Card" is on a web site at http://members.xoom.com/ZL1BPU/ZL1BPU/EUREKA/home.html. You can download the complete guide and operate it from a floppy disc, by downloading the file http://www.qsl.net/zl1bpu/FUZZY/software/EUREKA.zip. This is something you give to your friends!

(2) PSK31 software available from the PSK-31 web site, http://aintel.bi.ehu.es/psk31.html.

(3) IZ8BLY Hellschreiber available from Nino's web site, http://space.tin.it/computer/aporcino.

(4) WINLINK software and information is available from http://www.winlink.org/.

(5) See http://www.aprs.net/.

DX PacketCluster

by
MURRAY WOODFIELD ZL1CN
CHRIS HANNAGAN ZL2DX

The DX PacketCluster is a Packet BBS provided especially for DX operators. While it has the normal bulletins and mail facilities normally associated with a Packet BBS, it also has many other features of interest to DX operators.

For example, if anyone logged on to the DX PacketCluster hears some interesting DX, this "DX spot" can be put up on the Cluster for the benefit of any others who may be logged on. The others will see the DX spot in real time, and anyone interested can tune up and work the DX station. This is the prime purpose of the DX PacketCluster.

There are also other features such as WWV sunspot information which can be put up, a list of current DXCC countries with prefixes, headings and distances from your QTH, and sunrise and sunset information for each country.

Various DX bulletins are put up on the Clusters from time to time.

The following is the information for those interested in connecting to a DX PacketCluster:

ZL1BN Auckland. Access through the Klondyke node, 1200 baud on 145.625 with negative split, or 9600 baud on 438.350MHz with negative split, or on the local port 144.65 MHz simplex. A further port is provided on 10142.4 kHz USB 300 baud packet.

ZL1HY-10 Walton. Access through the Klondyke node, 1200 baud on 145.625 with negative split, or 9600 baud on 438.350MHz with negative split, or on the local port 144.725 MHz simplex.

ZL2AQY-10 Stratford. Access through 5725 Manawatu Data repeater, 5350 Kapiti Data repeater 2400 baud, 144.650 OTO Digipeater, 5625 Klondyke node.

ZL2AL-10 Hastings. Access on 144.650 MHz.

ZL2NX Martinborough. Access through 6625 Wellington Data repeater, 7075 Wellington 2400 baud repeater, 5725 Manawatu Data repeater, 860 Mt Climie 70cm Data repeater at 9600 baud, 5425 Mt Climie.

ZL3DXC Christchurch. Access through 144.650 MHz, or on 10142.4 kHz USB 300 baud packet.

The ZL1BN and ZL1HY-10 Clusters are linked through the Klondyke node. These two are linked to ZL2NX through ZL2AQY at Stratford, however, the link is somewhat tenuous because of propagation variations on 2 m. It is hoped that this link will be made more reliable in the near future. Also, ZL1AL-10 is linked in through Taupo to ZL2AQY-10. Efforts will also be made to extend the network further, depending on the availability of resources.

If you are keen on DX on any band, including VHF and UHF, then the DX PacketCluster is for you. Even if you have no experience at Packet, you will benefit from connecting to a Cluster, and staying connected while you are tuning the band—you will even be able to put up spots yourself for the benefit of others.

Further information is available from the sysops, Murray ZL1CN, Mike ZL1HY, Eddie ZL2AQY, Lee ZL2AL, Chris ZL2DX and Graham ZL3NZ.

Murray Woodfield ZL1CN and
Chris Hannagan ZL2DX

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Send your name and Callsign with $5 to NZART Headquarters with the name and the address of the person you wish to receive the **Study Guide** and **Test Papers.** A diskette and gift folder will be posted—with your compliments. You will be named on the gift folder.

(Installation instructions are in a .txt file on the disk and printed inside the gift-folder.)

2. The **Guide** and the **Test Papers** can also be viewed and used on-line—by anyone. Visit the NZART web page:

http://www.nzart.org.nz and follow the links.

3. Both the **Guide** and the **Test Papers** can be downloaded in separate self-extracting files for installation on your own computer. Installation details are on the web page.

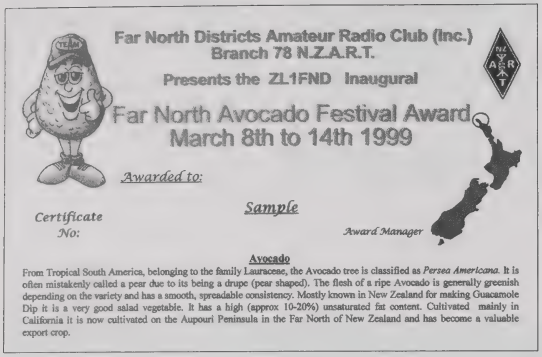
Downloading is recommended, so these documents can be used at any time.

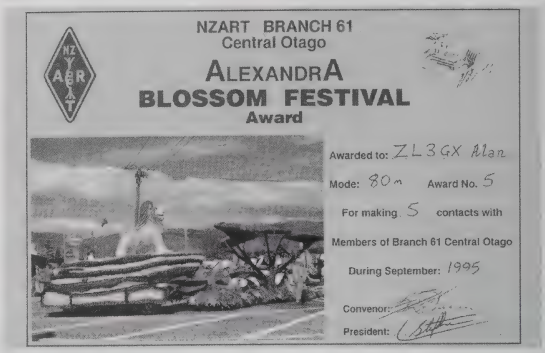
Please Note:

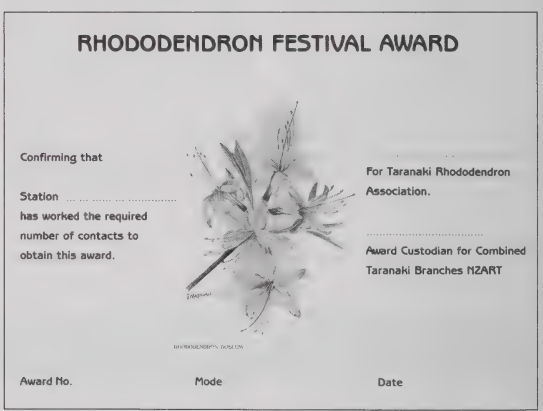
1. These documents can be used as a source of hand-out notes for Instructors at Radio Classes. Copy-and-paste can be used to copy material into a wordprocessor then photocopied for class use—or whole pages can be printed off.

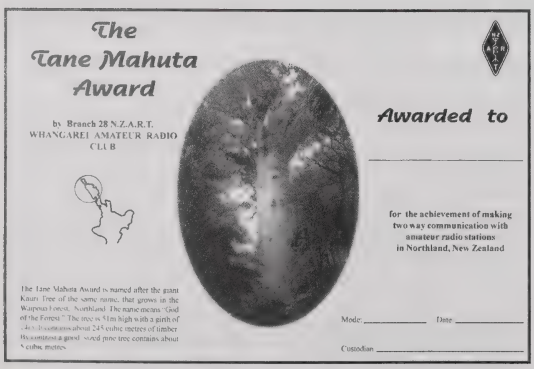
2. The **Guide** is NOT a replacement for the NZART *Basic Radio Training Manual*. They support and complement each other.

Some Awards available from NZART or from Branches


Far North Districts Amateur Radio Club (Inc.)
Branch 78 N.Z.A.R.T.
Presents the ZL1FND Inaugural
Far North Avocado Festival Award
March 8th to 14th 1999
Awarded to:
Sample
Certificate No:
Award Manager
Avocado
From Tropical South America, belonging to the family Lauracene, the Avocado tree is classified as Persea Americana. It is often mistakenly called a pear due to its being a drupe (pear shaped). The flesh of a ripe Avocado is generally greenish depending on the variety and has a smooth, spreadable consistency. Mostly known in New Zealand for making Guacamole Dip it is a very good salad vegetable. It has a high (approx 10-20%) unsaturated fat content. Cultivated mainly in California it is now cultivated on the Aupouri Peninsula in the Far North of New Zealand and has become a valuable export crop.






The Tane Mahuta Award
by Branch 28 N.Z.A.R.T.
WHANGAREI AMATEUR RADIO CLUB
Awarded to
for the achievement of making two way communication with amateur radio stations in Northland, New Zealand
Mode
Date
Custodian

by
ALLAN CHAPMAN
ZL3GX

Award Notes

When applying for an award, whether through NZART or through an overseas Society, courtesy demands that you observe the following: (1) PRINT your name, address and call-sign; (2) Clearly state what award (and endorsements) you are applying for; (3) Supply checking sheet with call-signs, dates of QSOs, mode, etc.; (4) Enclose required funds (currency/IRC/stamps) as requested.

For NZART Awards

1. The usually accepted rules apply to all NZART awards.
2. NZART stresses the HONOUR SYSTEM. Awards applicants need NOT hold QSL cards for claimed contacts. It is sufficient to merely certify that the QSO was legitimately made. This no QSL rule applies ONLY to NZART sponsored awards.
3. Endorsements for mode/time/location etc., made at applicant's request.
4. New Zealand, US or Australian currency accepted instead of IRC but cheques NOT desirable. New Zealand stamps OK but please nothing over $2.00.
5. Post applications to NZART Awards Manager, PO BOX 1733, Christchurch 8015, New Zealand.

APPLICATION FORMS suitable for most awards are available from NZART Awards Manager (SASE Please).

COST OF AWARDS. NB—Cost given for awards are those for ZL applicants. Overseas applicants pay $5.00 for each NZART award EXCEPT WAP ($6.00).

For Branch Awards

Logs need not be verified unless stated.

All awards are open to shortwave listeners unless stated.

The honour system also applies to Branch awards.

NZART AWARDS

CJC

Captain James Cook Award

To perpetuate the memory of this world famous navigator and seaman—in three classes: Basic "Sailor Class" requires contacts with—G in Yorkshire; FO8; ZL2; VK2; KH6 ... For "Officers Class"—"Sailor Class" contacts as well as ZL1, ZL3, ZL4, VK3, VK4, New Guinea, and any Antarctic station ... For "Command Class", as for "Officer Class" as well as any five of the following—VE2, VO, A35, YJ8, FK8, CE8, KL7.

Certified list (confirmations not required) with $3.00, overseas US$5.00, to NZART Awards Manager.

ENZART

A prestige award to honour NZART

1. In three parts—(A) Basic award requires 200 points with endorsements for 250, 300, 350 points. (B) Honour award requires 400 points with endorsements for each additional 50 points. (C) HONOUR PLAQUE for 500 points.

2. Points earned as follows by contacting an NZART member who is on the voting roll of the Branch concerned—Phone QSO, 1; CW QSO, 2; Club Station QSO, 2; YL op. QSO, 1; UHF, VHF QSO, 1; Mobile QSO, 1; AMSAT QSO, 1; Branch President QSO, 1.

3. It is essential to clearly determine that the operator contacted is a financial member of NZART and on the voting roll of the Branch concerned.

4. Contacts claimed with a Branch Station must be from a Clubroom or other permanent headquarters, or alternatively when the station is being operated in a contest, from an exhibition, or other activity of a similar kind. Contacts as a result of call-sign "swapping" at a member's QTH are not eligible.

5. Contacts with mobiles are eligible only when the mobile station is within 50 km of his Branch's Clubrooms or his own QTH. (Note rule 3 above.)

6. One station may be claimed in several categories—e.g. the Branch President can be claimed for both Phone and for CW as well as for Branch President—but EACH claimed must be for a separate contact, and the contacts must be not less than 24 hours apart.

7. Contacts must be "Phone to Phone" or "CW to CW".

8. "Club Net" contacts are not eligible until the net concludes, while contacts made in an organized "awards net" with MC etc., are not eligible.

9. Permanent changes of QTH by claimant are permitted and likewise contacts made during genuine temporary operation.

10. ZL applicants must be members of NZART and all applicants must certify that each contact made fulfils award requirements. No QSL card need be held or submitted but applications must be made on special Check List—cost 10 cents plus SASE (large). Contacts must date November 1 1976 or later.

11. Each certificate costs $3.00, overseas US$5.00. Endorsements free but SASE required. Overseas US$2.00 Honour Plaque NZ$10.00, overseas US$12.00.

12. Applications to NZART Awards Manager.

IARU Region III Operating Awards

To publicise Region III

1. The award is available to licensed amateurs and SWLs.

2. Contacts made after April 5 1982 are eligible.

3. QSL cards NOT required. Send certified list of eligible contacts from Log Book. Include country in log.

4. Cost is $3.00, overseas US$4.00.

5. Eligible countries are those in Region III whose amateur societies are members of IARU Region III Association. These are: Australia, Bangladesh, Brunei, China (PRC), Chinese Taipei (Taiwan), Fiji, French Polynesia (FO8 only), Hong Kong, India, Indonesia, Japan, Korea, Malaysia, New Caledonia, New Zealand, Pakistan, Papua New Guinea, Philippines, Singapore, Solomon Islands, Sri Lanka, Taiwan, Thailand, Tonga, Vanuatu.

PLUS: ONE Country credit from US Territories in the Pacific from Guam, Northern Marianas, American Samoa, Wake Island, Baker Howland Group, as presented by ARRL. ONE Country credit from Pitcairn Island (VR6), Chagos Archipelago (VQ9), represented by RSGB. Current total of available "countries" is 31. Requirements for Award as from January 1 1986: Basic, seven areas; Silver Endorsement, 15 areas; Gold Endorsement, 20 areas. These to be reviewed as considered necessary by the custodian who would recommend appropriately to the Secretariat.

6. Awards may be endorsed for any mode or band.

7. Applications to NZART Awards Manager.

NZART Guiding Light Award

This award requires contacts with stations within 30 km of the more remote lighthouses and 10 km of the lighthouses near cities. Depending on the degree of difficulty each lighthouse has been allocated one to five points. A total of 20 points are required for the basic "Mariners" Award and 50 points for the "Master Mariners" Award.

The lighthouses

North Island	Points	km
Cape Reinga	2	30
Cape Brett	1	30
Mokohinau	5	30
Cuvier Island	3	30
Tiritiri Matangi	1	10
Bean Rock	1	10
East Cape	2	30
Portland Island	2	30
Castlepoint	2	30
Cape Palliser	2	30
Baring Head	1	10
Pencarrow	1	10

	Points	km
Somes Island	1	10
Cape Egmont	1	30
South Island		
Cape Foulwind	1	30
Kahurangi Point	3	30
Farewell Spit	2	30
Boulder Bank	1	10
Stephens Island	5	30
The Brothers	2	30
Cape Campbell	1	30
Godley Head	1	10
Akaroa	1	30
Moeraki	1	30
Taiaroa Heads	1	10
Cape Saunders	1	10
Nugget Point	2	30
Waipapa Point	2	30
Dog Island	1	30
Centre Island	1	30
Puysegur Point	5	30

Full log sheets available from Awards Manager. Eligible contacts for this award must be dated November 1 1998 or later. Cost of both awards $5.00, overseas US$5.00 or five IRC. Applications to NZART Awards Manager.

MIA

Minor Islands Award

For contacts with minor islands of the New Zealand coast—e.g. Kapiti Island, Portland Island, Great Barrier Island, Little Barrier Island, Waiheke Island, D'Urville Island, Rangitoto Island, Kawau Island, Motutapu Island, etc., from which FIVE contacts are required. Certified list with $3.00, overseas US$5.00, to NZART Awards Manager.

1. So-called "islands" which are connected to the mainland by a causeway and rocks are not eligible.

2. The station must be located on the island or within the waters up to one nautical mile offshore, unless prevented by hazardous conditions.

3. Where public access is available, M/M stations must be on a mooring, ie, wharf, jetty, buoy, or anchor, or on arrival or departure from a mooring.

National Parks Award

1. For contacts made with stations operating WITHIN boundaries of a New Zealand National Park.

2. Basic award requires TWO contacts.

3. Usual NZART awards rules apply.

4. Endorsement: for each extra two contacts; for VHF Simplex; for VHF via repeater; for each amateur band; etc.

5. Duplicate Contacts (with SAME station) permitted ...

★ on different amateur bands
★ on different days
★ from different Parks.

6. Eligible contacts to date from January 1, 1988.

7. Applications with $3.00, overseas US$5.00, to NZART Awards Manager.

NZ Armed Services Award

This award is presented by the Counties Awards Net to remember all amateur radio operators who have served their country.

This award is open to all amateurs and SWLs.

All contacts made after August 1, 1992 will be eligible for this award.

All Amateur bands and modes may be used.

Repeater contacts accepted.

A station may only be contacted once.

Only one service number may be used.

ZL stations to work 100 contacts. VK stations to work 50 contacts. DX stations to work 30 contacts.

Information required: Log data, Service Number, Service in which served (ie, (A) Army, (AF) Air Force, (N) Navy.

Cost of Award: $3.00, overseas US$5.00.

Custodian: NZART Awards Manager.

Check sheet and rules also available from Awards Manager with SASE.

Provision for Award Update if required.

NZA—New Zealand Award

Available to all radio amateurs other than ZL.

Requirements:

35 contacts with ZL1.

plus 35 contacts with ZL2.

plus 20 contacts with ZL3.

plus 10 contacts with ZL4

plus one contact with ZL "territory"—either from NZ Antarctica, Chatham Islands, Kermadec Islands, or Campbell Island. This one contact may be substituted by 20 ordinary ZL contacts if desired.

This makes a minimum of 101 contacts which should be dated from December 8, 1945. Cost $3.00, overseas US$5.00.

NZC—New Zealand Counties

Basic award required contacts with 20 different New Zealand Counties. Endorsements for 40, 60, 80, 100 are made with a special certificate for 112. Map showing counties is depicted elsewhere in this section, while checking sheet is available from NZART Awards Manager.

1. Initial certificate with any or all endorsements to 100 costs $3.00, overseas US$5.00.

2. Separate endorsements to 100, after issue of basic award, costs 20 cents for any group—or one IRC. Plus SASE.

3. Special Certificate for "NZC 112" costs $3.00, overseas US$5.00.

4. Checking sheets which MUST be used and which are returned to applicant for record purposes cost SASE, overseas US$2.00.

5. NZC "224"—the "224" Shield was instituted to recognize very outstanding achievement—that of "double 112" with different stations contacted in the relevant counties for each NZC 112. Current cost is $15.00, overseas US$25.00 (surface mail only). Applicants for NZC 224 must first hold TWO NZC 112 Awards. Send BOTH log sheets when applying for 224.

6. The operator on a "County DXpedition" whether Mobile or Fixed Portable may claim that County for his own NZC credit.

7. The original "Counties List" will be maintained irrespective of deletions or additions. The criteria will be the actual area of operation which must be determined by the honour of the operator.

NZLA—New Zealand Lakeside Award

1. For Basic Award, contacts are required with stations operating on the shores of TEN (10) freshwater lakes in New Zealand. Endorsements for each additional ten lakes up to 40; Honour Award for 50 lakes with further endorsement for each additional ten.

2. Stations must be located within ONE kilometre of the water or in a town on the lake shore.

3. Full rules are with the Check Sheets which MUST be used when applying for NZLA—these cost a 40 cent stamp plus SASE.

4. Basic Award costs $3.00, overseas US$5.00. Any endorsements SASE, overseas US$2.00.

5. Check Sheets from NZART Awards Manager to whom all applications must be directed.

6. Eligible contacts must date May 1, 1976 or later.

NOTE: Check Sheets are returned to applicant and make up a complete record of lakes credited towards award. Basic work for this award was done for NZART by Mike Groth ZL1AHF.

NZART Century Award

Basic requirements

This award is based on the Maidenhead Locator System. The award is open to all amateurs and SWLs. One hundred different sub-squares are required for the Century Award.

Endorsements for each subsequent 100 sub-squares worked.

Addict certificate for 500 sub-squares.

Each contact must state the fill six digits of the Locator position, eg, RF66HK.

Eligible contacts must date January 1 2000 or later.

Any operator on a "Century Award DXpedition" whether mobile or portable may claim the sub-square for their own credit.

Note

All contacts must be from the New Zealand mainland or surrounding islands.

Log sheets and maps, which give a broad outline of the Squares are available. The map supplied does not give an accurate position of the squares. Info maps that have latitude and longitude must be used for the position of the Sub-squares. For example, InfoMap series 242-1, 242-2, 242-3, 242-4, or similar.

A DOS-based program that will return the square for a given latitude and longitude is available via e-mail or send a 3.5" floppy with return postage to the NZART Awards Manager.

Cost

Century and Addict Certificates $5.00, overseas A$5.00 or US$5.00. Endorsements $1.00 each.

NZR Regions Award

This award is similar to the NZ Counties Award but relates to the current Regional Districts.

Basic requirements

Initial certificates with four Regions and 18 Districts.

Stickers for 8/36 and 12/54 Regions and Districts.

Special award for all Regions and Districts.

Contacts must date January 1 2000 or later.

Cost

Basic award NZ$5.00. Endorsements SASE plus a 40 cent stamp.

Overseas US or A$5.00 or five IRCs. Endorsements $2.00 or two IRCs.

All Regions and Districts Award NZ$5.00, US$5.00 or A$5.00.

Double Region Award $15.00, overseas $25.00 (surface only).

Boundaries

The boundaries are as per

InfoMaps 242B-1 to 242B-4 (four maps) and will remain to give a basis of stability.

Applications for the award must be on the log sheets which are available from the NZART Awards Manager. Send SASE or via e-mail (PDF file).

The following is a list of Districts (bold Italic type) and the regions.

North Island Regions

Northland
- Far North
- Whangarei
- Kaipara

Auckland
- Rodney
- North Shore
- Waitakere
- Auckland
- Manukau
- Papakura
- Franklin*

Waikato
- Thames-Coromandel
- Hauraki
- Waikato
- Matamata Piako
- Hamilton
- Waipa
- Otorohanga
- South Waikato
- Waitomo*
- Taupo*

Bay of Plenty
- Western Bay of Plenty
- Tauranga
- Rotorua*
- Kawerau
- Whakatane
- Opotiki

Gisborne
- Gisborne

Hawkes Bay
- Wairoa
- Hastings
- Napier
- Central Hawkes Bay

Taranaki
- New Plymouth
- Stratford
- South Taranaki

Wanganui-Manawatu
- Ruapehu
- Wanganui
- Rangitikei*
- Manawatu
- Palmerston North
- Horowhenua
- Tararua

Wellington
- Masterton
- Carterton
- South Wairarapa
- Kapiti Coast
- Porirua
- Upper Hutt
- Lower Hutt
- Wellington

South Island Regions

Nelson
- Nelson

Marlborough
- Marlborough

Tasman
- Tasman

West Coast
- Buller
- Grey
- Westland

Canterbury
- Kaikoura
- Hurunui
- Selwyn
- Waimakariri
- Christchurch
- Banks Peninsula
- Ashburton
- Mackenzie
- Timaru
- Waimate

Otago
- Waitaki*
- Queenstown-Lakes
- Central Otago
- Dunedin
- Clutha

Southland
- Gore
- Southland
- Invercargill

*Districts cross Regions boundaries.

Tiki Award

Work five different ZLs each on FIVE different bands dated post-war. Cost $3.00, overseas US$5.00.

ZL1 Award

Basic Award requires contacts with 125 different ZL1 stations dating post-war. Endorsements 175 and 250.

ZL2 Award

Basic Award requires contacts with 100 different ZL2 stations dating post-war. Endorsements for 150 and 200.

ZL3 Award

Basic Award requires contacts with 50 different ZL3 stations dating post-war. Endorsements for 75 and 100.

ZL4 Award

Basic Award requires contact with 25 different ZL4 stations dating post-war. Endorsements for 35 and 50.

Note: cost of ZL1/2/3/4 Certificates is $3.00, overseas US$5.00, each with any endorsements. Further endorsements will cost 40 cent stamp plus SASE, overseas US$2.00, UNLESS a new certificate is required instead of "sticker", in which case the cost is as above. On issue, certificates will be endorsed for band/mode as requested and for any yearly period of time (January through December). Such endorsements are of course available to applicants at any time after the initial award has been made. ZL or ZM combination is OK. Applications with list to NZART Awards Manager.

VHFCC—VHF Century Club

One hundred points required from QSOs with ZL stations on the following basis:

50 MHz band contacts count one point.

144 MHz band contacts count three points.

432 MHz band contacts count six points.

(Further bands may be added in the future).

The same station may be claimed once on any one band but may be claimed repeatedly on different bands.

Endorsement stickers available for 200, 300, 400, 500 points. Cost $3.00, overseas US$5.00.

WAD—A VHF Award

Contacts required on any VHF band (or mixture of VHF bands) with ZL1, ZL2, ZL3, ZL4—One contact per Call Area. Cost—$3.00, overseas US$5.00. Endorsements for Satellite QSOs.

WAP—"Worked All Pacific"

Contacts required with 30 different "Oceania Countries".

Eligible countries ... Any Oceania country, i.e. eligible as Oceania for WAC (see DXCC list). Cost $3.00, overseas $6.00. Please include country on log sheet.

Five Band WAP

Contact any 30 eligible Pacific Countries (as counting for Oceania for WAC), each on FIVE different bands making a total of 150.

Send list of log extracts (QSLs not required to be held) to Awards Manager ... with $15.00, overseas US$25.00 surface mail only.

AWARD: Wooden Shield surmounted with NZART badge and suitably inscribed.

WAZL—"Worked All New Zealand"

Contacts required for 45 different Branches of NZART—EXCEPT FOR OVERSEAS APPLICANTS (for whom only 35 are required). Special endorsement when WAZL completed within 12 month period. NB: Mobiles operating outside their own Branch Area must use the Branch Number of the area in which they are operating (for WAZL credit). Cost $3.00, overseas US$5.00 to NZART Awards Manager.

NZART Branches for WAZL

01 Ashburton
02 Auckland
03 Western Suburbs
04 Cambridge
05 Christchurch
06 Tararua
07 Not issues
08 Eastern Southland
09 Egmont (in recess)
10 Franklin
11 Gisborne
12 Hamilton
13 Hastings/Havelock
14 Hawera
15 Central Hawkes Bay
16 Horowhenua
17 Huntly
18 Hutt Valley
19 Inglewood
20 Manawatu
21 Manukau
22 Marlborough
23 Marton and Districts
24 Motueka
25 Napier
26 Nelson
27 New Plymouth
28 Whangarei
29 North Shore
30 Otago
31 Pahiatua (in recess)
32 Rahotu Coastal
33 Rotorua
34 South Canterbury
35 Balclutha
36 South Westland
37 Southland
38 Taumarunui
39 Tauranga
40 Te Awamutu
41 Thames
42 Titahi Bay
43 Waihi and Districts
44 Matamata
45 Waimarino
46 Wairarapa
47 Waitara
48 Wanganui
49 Westland
50 Wellington
51 Eastern Bay of Plenty
52 Northern Hawkes Bay
53 Te Puke
54 Patea
55 Waitomo
56 Christchurch West
57 Tokoroa
58 Helensville (in recess)
59 Mangakino (in recess)
60 Taupo
61 Central Otago
62 Reefton-Buller
63 Upper Hutt
64 North Otago
65 Papakura
66 Auckland VHF

67 Kawerau
68 North Canterbury
69 Kapiti
70 Feilding
71 Rodney
72 Opotiki
73 Northern Wairoa
74 Wellington VHF
75 Queenstown
76 Kaikoura
77 Te Aroha
78 Far North Districts
79 Howick and Districts
80 Hibiscus Coast
81 Waikato
82 Southern Wairarapa
83 Raglan
84 Bay of Islands
85 Mercury Bay

Yearly Award

This award is an annual award starting on January 1 and ending on December 31 each year.

The rules are as follows:

1. A total of 80 contacts required.

2. The numbers of years licensed must be obtained from station worked.

3. The licensed years are totalled to 1000 or more years.

4. Log details must include the operator's call-sign, name, licensed years and date worked.

5. The award is open to all SWLs who must include in addition to the above, both operators names and call-signs.

6. Logs must include at least 20 ZL contacts.

7. Send $3.00, overseas US$5.00, to the NZART Awards Manager.

"5 × 5"—Five by Five

This premier award has been instituted to recognize the increasing interest in Five Band DX operation. The initial award requires that the same station be contacted on five bands repeated with five different DXCC countries. First endorsement after a further five has been contacted (total of 10) with the 20 endorsement requiring another ten and so on to 100. Certified list with full QSO data and fee of $3.00, overseas US$5.00, which includes all endorsements. Certificate is outstanding and is overprinted in embossed gold. Contacts must date from 1945.

ZLA Award

Contacts required with Auckland City, Wellington City, Christchurch City, Dunedin City, Antarctica ZL5, Campbell Island, Chatham Island, Kermadec Island. Applicants must send certified list to NZART Awards Manager with $3.00, overseas US$5.00. Specially produced certificate.

NZART Branch Awards

Aotearoa Postcode Award

This award has been presented to stimulate awareness and the use of postcodes in the New Zealand postal system—at least by the amateur fraternity. To some extent it is a sister award to the Australian Amateur Radio Postcode Club. At the present time there are 613 postcodes in use, so the upgrades will not come easy. Best of luck.

1. The award is open to all Amateurs and SWLs.

2. All contacts made on or after October 20, 1991, will be eligible for the award.

3. A certificate will be issued for basic qualification, and stickers for the various following upgrades.

4. Portable and mobile stations must give the postcode for the particular area they are in and can claim that postcode for the award.

5. **Basic Award:** Make contact with ZL stations and obtain their QTH and Postcode. Then use the suffix letters of the station claimed to complete the following phrase—AOTEAROA LAND OF THE LONG WHITE CLOUD.

Each letter of a call-sign may only be used once unless that station is contacted in a different postcode area. Claim each postcode once only.

6. Upgrades: Stickers will be issued as follows: Postie—100 different postcodes; Mail Officer—150 different postcodes; Supervisor—200 different postcodes; Branch Manager—250 different postcodes. (There is provision for an extension for the enthusiast.)

7. All amateur modes and bands may be used. Repeater contacts accepted.

8. Cost: Basic certificate—

ZL stations	$3.00
VK stations	US$2.00
DX stations	US$3.00

Upgrades—

ZL stations SASE plus $1.00 for first—SASE for other three.

VK Stations SASE plus $1.00 stamp for each upgrade.

DX stations SAE plus US$1.00 for each upgrade.

9. A copy of your log is to be submitted upon application for the awards and sent to: Awards Manager, 48 Leslie Street, Waitara 4656.

Bay of Plenty Awards

Sponsored by the Tauranga Branch 39 of NZART. For working stations in the Bay of Plenty region—viz, Opotiki, Rotorua, Taupo, Tauranga and Whakatane Districts and all cities and districts within this region.

ZLs need: either 10 stations on any band or five stations on VHF bands.

The Rest of the World need: five stations on any band.

This award is available to listening stations on a "heard" basis.

Note:

ZL1BNW is an instant qualifier. Costs: $4.00.

Applications with check list, showing station, date worked, mode and band (QSLs not required) to John V. Collin ZL1BNW, 65 Paine Street, Judea, Tauranga 3001, New Zealand.

Christchurch Award

Requirements:

Christchurch amateurs 25 different stations; rest of ZL—15 stations; VK—10 stations; rest of world—five stations. Cost: ZL and VK NZ$5.00; others US$4.00 or equivalent. Applications to Christchurch Branch Awards Manager, Box 1733, Christchurch.

Christchurch Amateur Radio Club Branch 05 Brasspounders' Club Award

The aim of this award is to promote Morse technique in a friendly competitive way and to encourage conversational CW between fellow amateur radio enthusiasts.

A Certificate of Accomplishment will be issued by the Christchurch Branch Awards Manager when suitable evidence shows that the applicant has gained the appropriate points total.

For the "INITIAL AWARD" (25 points minimum) the following QSO types are acceptable.

1. CW QSO with Christchurch Amateur Radio Club Branch 05 Club member—one point.

2. CW QSO with Christchurch Amateur Radio Club Branch 05 "Brasspounders" Club member—two points

3. CW QSO with Christchurch Amateur Radio Club Branch 05 "Brasspounders" Club member via ZL3AC Club Station—four points

Bonus points may be added to each of the above according to the following criteria:

4. If the QSO was conducted throughout using a STRAIGHT key, claim two bonus points.

5. If the QSO was conducted throughout using an a ELECTRONIC keyer or SEMI-AUTOMATIC key (bug type) claim one bonus point.

A QSO conducted with COMPUTER Morse will not be eligible for a bonus.

Type "3" QSOs if multiple, must be spaced at least 24 hours.

Award *Par Excellente*

60 points minimum

For "AWARD PAR EXCELLENTE", New Zealand "Home Stations" must include at least two type "1" QSOs, and there is no points limit on type "5" contacts. Where the same station is being claimed more than once, there must be at least 24 hours separation between the QSOs.

Overseas stations need only one type "1" QSO for their "Award Par Excellente" included with their claim, and may claim two points for each "ZL" QSO together with one extra bonus point if the "ZL" is a "Branch 05 member". At least 24 hours must separate QSOs where the same station is being claimed more than once.

Rules

Frequencies: All Amateur Band CW frequencies may be used.

Who: All Radio Amateurs.

Claims: Log extracts showing date, time on/time off, signal reports, other operator's call and QTH.

Check: Log extracts shall be countersigned by one other similarly licenced amateur operator.

Duration: Contacts claimed shall have been of at least one-quarter hour (15 minute) duration.

Signals: No claims will be accepted with reports of T7 or lower.

When: Only QSOs commenced after the inauguration are acceptable. Inauguration date is February 1, 1993. There is no closing date for claims unless the award termination is promulgated.

Points: Points claimed for "INITIAL AWARD" may not be used for the "AWARD PAR EXCELLENTE".

Costs: NZ$12.00 Initial Award.

The Club Station ZL3AC will be on the air from 0800 UTC on an occasional basis. The operating frequencies are from 3.5 MHz to

3.575 MHz and on other HF bands depending on conditions.

Address all claims to Christchurch Amateur Radio Club Awards Manager, PO Box 1733, Christchurch, New Zealand.

City of Dunedin Award

Otago Branch 30 promotes this award which features colour photographs of Albatrosses in the colony on the Otago Peninsula, the lighthouse at Tairoa Heads, and a view of Dunedin City from Stuart Street.

Contacts since July 1 1986 eligible and the required 10 points for ZL applications (five point DX) may be accumulated from the following allocations:

ZL4AA Branch station	3 points
Branch 30 President	2 points
Branch Life Member	2 points
Branch YL	2 points
Other Branch members	1 point

Award is open to SWLs.

NO repeater contacts and each station can be worked ONCE only. Any one band/mode or a combination of any bands/modes may be used.

Cost— NZ$2.50 with application to Awards Manager, PO Box 5485, Dunedin 9015.

Fiordland National Park Award

Requirements: Contact four separate stations/operators in or within one kilometre of the Fiordland National Park, plus two contacts with Branch 08 members. Total—six contacts. Send log (no certifying required) with $1.50 (stamps OK) to George McKenzie ZL4JP, Waiparu, No. 7 RD, Gore 9700.

Gisborne Award

Requirements: Contacts after January 1 1969, as follows: Gisborne amateurs—ten different stations. ZL—four stations. Rest of world—two stations.

Cost: $5.00. Apply to Awards Manager, PO Box 1017, Gisborne 3815.

Golden Shears Award

This Award is established by Branch 46 of NZART to celebrate the annual Golden Shears Society's sheep shearing competitions, an event of international significance. This agriculturally based competition draws top competition from New Zealand and around the world.

The award will be an annual event and will run for 14 days ending at midnight on the first Saturday in March in each year, and the night upon which the competition finals are scheduled.

2. The Award is available to all Amateurs and Shortwave Listeners.

3. Contacts will be confined to 80 m SSB and 2 m FM, each of which will attract a separate award certificate. Note that any contacts made on 2 m repeaters, or with Branch 46 members who are operating Mobile, are permitted.

4. New Zealand stations require 10 points from those listed below:

(a) Compulsory contact with Club Station ZL2OA equals five points.

(b) Contacts with individual members' stations equals one point.

5. Overseas stations require five points from those listed above but no COMPULSORY CONTACT with ZL2OA is needed.

6. A copy of log details, with appropriate fee, is to be received at the following address before March 31 in the Award year:

The Award Custodian
NZART Branch 46
PO Box 860
Masterton 5915

Award applications from New Zealand stations will cost NZ$5.00 and from Australian stations will cost A$5.00 for each separate Award certificate.

8. Award applications from other Overseas stations will cost US$5.00 for each separate Award certificate.

9. Award fees cover all return postage charges.

10. Award Certificate will be a colour print, portraying a scene of significance to the Wairarapa, overprinted with detail of the "Golden Shears" emblem and the year awarded. A different scene will be used for each year.

11. ZL2OA and Branch members' stations will operate on a roster basis during the Award period, on or about the following frequencies:

(a) Awards Net—3.677 SSB most nights.

(b)The 2 m repeaters within the Wairarapa will be monitored most evenings.

12. The above rules and conditions will apply from February 1998.

Kapiti Branch Award

1. Ten points required on any band—including VHF-UHF and repeater contacts. Different stations are required.

2. One point for any NZART member residing permanently in the district.

3. Two points for any branch member.

4. Three points for any committee member.

5. Four points for ZL2KB.

6. Net contacts are permitted, except the Branch net.

7. A listeners' award is available. Recording of sufficient two-way contacts worth 10 points.

8. Packet contacts attract two points each for Kapiti Branch member worked direct.

9. Double points for CW contacts, excluding Field Days.

10. No two contacts with the same station are permitted.

11. Price $3.00 per certificate.

12. Enquiries to Award Manager, Haydn Sherley ZL2AWI, PO Box 166, Paraparaumu 6450, New Zealand.

Manawatu Award

For overseas stations working FIVE stations who are members of Manawatu Branch 20. Certified list and $3.00 or five IRCs to ZL2AFT, 429 Albert Street, Palmerston North 5301.

Marlborough Festival Week Award

This award, arranged by Branch 22 to coincide with the Marlborough Festival Week held each year in the month of February. The week celebrates the beginning of the grape harvest and the rich diversity of vineyard, orchard, pasture and ocean products that go to make Marlborough the "Gourmet Province". Participants in the award will receive an attractive certificate carrying the special event call-sign ZL6MWF.

Award Rules

1. Certificate will be sent to ZL stations presenting Log Sheets claiming 20 points, including one (only) contact with ZL6MWF and enclosing $3.00 to cover printing and postage.

2. Certificates will be sent to overseas stations presenting Log Sheets claiming 10 points, including one (only) contact with ZL6MWF and enclosing $3.00 (New Zealand equivalent) (not postal coupons) to cover printing and postage, and be received before March 31.

3. Log Sheets must show date, call-sign, signal report, Branch 22 operator's name, points claimed.

4. All applications for the award must be made in writing to: The Award Secretary, Branch 22 NZART, PO Box 432, Blenheim 7315, New Zealand.

Points

Six points for working ZL6MWF (compulsory).

Three points for working ZL2KS (Club Station).

Two points for working any member of Branch 22.

A suitably endorsed Award Certificate will be awarded to the operator collecting the most points.

ZL6MWF will only be counted once. Other stations including the Club Station ZL2KS may not be worked more than once on any particular day but may be worked on different days.

Times and Frequencies

ZL6MWF and ZL2KS may appear on any band at any time but will be active exclusively on 80 m around 3.575 MHz ± between 2000 hours and 2100 hours each evening during the award period.

Members of Branch 22 involved in giving out points will advertise the fact by adding the words "for Branch 22 Award" in their normal call and may also appear on any band at any time.

Details published in *Break-In* each year.

Papakura Radio Club "21" Award

For contacts with 20 members of Papakura Radio Club PLUS ZL1VK dating from January 1 1977. Band/Mode endorsements; certificates not numbered; no repeater contacts; certified list and $2.00 to Miss C. Johnson ZL1AJL, PO Box 397, Papakura.

Railways Award

This Award is sponsored by Southern Wairarapa Branch 82.

To work amateurs within one kilometre of railways stations which are the stopping places for the "Northerner", the "Southerner", and Picton-Christchurch Express (Auckland to Invercargill). Full rules on the check sheet.

Check sheet which contains full rules is available. Send SASE to Awards Custodian, ZL2GJ, *Call Book* address. Cost of the Award is $3.00 (stamps OK).

Reefton-Buller Award

Basic Award requires contact with any five Branch 62 members.

Merit Award requires, in addition to Basic, that ZLs contact one Branch 62 XYL or YL and the Club station ZL3BRC. Overseas stations contact any one of those mentioned above. Two categories HF and VHF.

NO QSLs required. Send certified list with $5.00 to NZART Awards' Manager. List of members etc available from Branch 62 Secretary.

The Rhododendron Festival Award

Rules

1. The Award will run for two weeks about the beginning of November each year. It is available to all Amateurs and Shortwave Listeners.

2. Contacts may be made on any band, any mode. Each station may be worked *once only* for each separate application for the Award.

3. *New Zealand stations* require 25 points from those listed below:

- Compulsory contact with Special Event Station ZL6RFA—five points
- Contact with Taranaki Branch stations—three points
- New Plymouth Branch 27—ZL2AB
- Hawera Branch 14—ZL2AWW
- Rahotu Coastal Branch 32—ZL2ANN
- Waitara Branch 47—ZL2TO
- Patea Branch 54—ZL2QF
- Each additional Taranaki station (ie, a station whose usual base station is in Taranaki)—one point

4. *Overseas stations* require only six points, calculated as above, and *do not have to make a compulsory contact.*

5. Copy of log, with a note of your Award choice and fee, to arrive before January 31, to:

The Award Custodian
NZART Branch 27
C/- 45 Robe Street
New Plymouth 4601
New Zealand

6. Fees, including return postage:

For ZL award applications, 2000 Certificate $6.00 each, "Blank" Certificate plus 2000 endorsement $7.00. 2000 Endorsement Sticker $2.80. (20c and 40c stamps accepted.)

For all overseas award applications, US$5.00 or fair equivalent.

No other stamps please.

General

There are six different Rhododendrons in this series, each is a limited print with the kind permission of local artist, Janet Marshall. See illustration on NZART web site.

ZL6RFA and Branch stations will be operating on a roster basis during the Award period, on or about these frequencies, Phone, most nights from 0700 UTC.

- The Rhodo Net—3.593 MHz
- The ZL Awards Net—3.677 MHz
- Popular VHF and UHF frequencies
- Any amateur frequencies may be used.

Full details will appear in the September/October *Break-In*.

Rotorua Amateur Radio Club Inc.

Maidenhead Locator Award Rules

1. The name of this award is the Maidenhead RF81 Rotorua Award—in short, The RF81 Award.

2. The Award is the responsibility of Branch 33, Rotorua, NZART.

3. The Award is for contacts into 98 Sub-squares and two contacts with the Club Station ZL1ROT.

4. A certificate will be issued upon completion of contacts into five Sub-squares plus one contact with the Club Station ZL1ROT.

5. Four Endorsements will be issued as the number of Sub-squares contacted reach 25, 50, 75, and 98. They will be known as the Geyser, Redwood, Lakeland, and Mountain Endorsements respectively. The final Endorsement requires a further contact with Club Station ZL1ROT, making a total of 100 contacts for the full award.

6. Contacts may be made on any Amateur band by any mode.

7. Operators working from a Sub-Square may claim that Sub-Square for their own Award.

8. Operators may be contacted before or after the Club Net (see *Call Book*) on 147.350 MHz. They will also operate on the Awards Net and other frequencies.

9. The masterplan of Sub-Squares will be held by the Award Manager. Copies, together with the Award Rules, will be circulated to the Award Net Controllers. A copy will also be supplied with the Certificate to assist operators to complete the Award.

10. The Sub-Squares identification are:

AL to GL, AM to GM, AN to GN, AO to GO, AP to GP, AQ to GQ, AR to GR, AS to GS, AT to GT, AU to GU, AV to GV, AW to GW, AX to GX, and AA to GA.

11. Claims for Awards are required to show: date, station contacted, band and Sub-Squares worked. SWLs are to quote both stations making contact and only one Sub-Square is to be claimed from each contact logged.

12. The Award will commence on March 25, 1988.

13. The cost of the Award is five only 40 cent stamps (note: only 40 cent stamps please).

14. Endorsements will be forwarded without further charge on receipt of SASE with claim.

15. Claims for this Award and subsequent Endorsements are to be addressed to: The Award Manager, Rotorua Amateur Radio Club Inc, 24 Iles Road, Lynmore, Rotorua 3201, New Zealand.

16. This issue of the Rules of the RF81 Award is effective from May 1 2000.

Taranaki Award

This Award started July 1 1994.

Basic Award for working 25 different Taranaki stations.

Endorsements are available for 50 and 100 contacts. Endorsement available on request for specific modes or bands.

School call-signs, special call-signs and Club call-signs also count.

Each station may be claimed once only.

Contacts must be made on different days to those claimed for other Taranaki Awards.

Cost of Basic Award—$5.00 and an SASE for Endorsements

Send application to:
Alistair Herbert ZL2WOW
Mataro Road
RD 45, Urenui 4655.

Te Puke Amateur Radio Club NZART Branch 53 Visiting Amateur Award

Objects of the Award

To encourage more use of the radio spectrum.

To ensure foreign amateurs visiting ZL are likely to get a two-way contact.

All classes of ZL licence holders ie, novices, technician and general can compete for the award.

Award criteria

Open to all licensed ZL amateurs who are members of NZART.

Basic Award: Ten QSOs with foreign/visiting amateurs.

Advanced Award: Ten QSOs with foreign/visiting amateurs from 10 different countries.

Supreme Award: Fifty QSOs with foreign/visiting amateurs from 50 different countries.

Award rules/conditions

All contacts must be two-way Voice/Phone within the geographical boundaries of ZL on any of the authorized bands in the amateur radio spectrum.

A "country" as defined by the ARRL DXCC Committee and cannot be a deleted one.

When applying for the award a log extract must be submitted showing: call-sign of station worked, date, frequency and country of origin ie, ZL1/K3ZO (USA).

Cost of Award

$5.00.

Cost of upgrades

$2.00.

Award Manager/custodian

Turner Fielding ZL1CDX.

Award commencement

All contacts from January 1 1998.

The Rosetown of New Zealand "Grand Award"

This Award, available in two levels, BASIC ADDICT, is workable world-wide by any Amateur Radio Operator or SWL.

Any mode, any amateur frequency, mixed band usage permitted, and repeater contacts are not barred. Net operation is also permissible.

The object is to contact Grandparent operators, and claim points according to the list given below.

All applicants must be licensed amateur radio operators and their station must be operated in accordance with the Radio Regulations, plus the terms and rules of their own administration. Good operating manners and techniques will be encouraged and only one QSO per call-sign is permitted over the two levels.

Points may be claimed as follows:

- A QSO with a Grandparent earns 10 points
- who is also a Great-Grandparent earns another 10 points
- who is also a Great-Great-Grandparent earns another 20 points
- and should there be a Great-Great-Great-Grandparent another 100 points
- and each Grandchild, Great-Grandchild, etc, earns 1 points

(For example, two Grandchildren, one Great-Grandchild and two Great-Great-Grandchildren = 5 points plus 40 = 45 sub-total for that QSO.)

The sub-total so claimed, is to be doubled if the operator contacted is a member of the National Radio Society of the country worked: ie, NZART, WIA, ARRL, etc.

The BASIC AWARD of 1000 points (QSL size) $5.00.

The ADDICT AWARD of 10,000 points (304mm × 203mm) $7.00.

Basic points can be credited towards the Addict.

Each Award is a beautiful photograph of a rose, and being laminated makes an ideal wall hanging or table placemat. The Award dates from January 1, 1992.

For Log Sheet and Rules, an

SASE (or IRC) to: Awards Manager, Te Awamutu ARC, NZART Branch 40, PO Box 583, Te Awamutu 2400, New Zealand.

(There is no copyright on photocopying the log or rules.) Applications for the Award to be forwarded with the appropriate remuneration to the above address. All awards by ordinary post. If airmail required, enclose appropriate IRC.

The Tane Mahuta Award

By Branch 28 with VHF and HF Rules:

1. The HF Tane Mahuta Award for 20 contacts including at least one in the each of the Counties of Rodney, Otamatea, Hobson, Hokianga, Mangonui, Whangaroa, Bay of Islands, and Whangarei with the rules of NZC Award applying.

2. The VHF Tane Mahuta Award for 20 contacts including at least one in each of the Locator Squares RF63, RF 64, RF65, RF74 and that part of RF73 north of 36° 30'; that is, with Sub-Squares ending in M to X. Contacts must be made from one square to another.

3. Portable and Mobile operation is permitted.

4. Multiple contacts are permitted provided the station contacted is located in a different County or Locator Square for each contact.

5. Repeater contacts are permitted if they are made through Northland repeaters at 7100, 7150, 7175, 7200 from outside the Northland area.

6. Contacts on or after January 1, 1985 are eligible.

7. QSL cards are not required. Send certified list of relevant data. BUT for the VHF Award it is necessary to establish the full QTH Locator of the station worked.

8. Applications to Tane Mahuta Award, PO Box 10-078, Te Mai, Whangarei, with cost as within New Zealand NZ$5.00, Australia A$5.00, others US$5.00.

Upper Hutt Award

Available to Amateurs and SWLs with any required endorsement for contacts after July 2 1972 with stations operating in Upper Hutt Valley which count as ONE point except YL ops and Club station ZL2VH which count as TWO points. Upper Hutt applicants require a total of 15 points; rest of New Zealand require 10; overseas require five points. Certified list with FULL QSO data (no QSL cards) with $2.00 or five IRC to Upper Hutt Award, PO Box 40-525, Upper Hutt. Note: mobile stations operating in the Valley count as a contact. Upper Hutt Club members outside the Upper Hutt Valley also count as a contact.

The Wellington Amateur Radio Club Inc, Branch 50 NZART Award

Requirements

ZL Amateurs need 20 points from working members of Branch 50. Club station ZL2WB counts five points, Branch 50 Committee members three points, all other Branch members count one point.

Overseas stations require five QSOs with stations in the Wellington area. (Wellington to Tawa but not Hutt Valley) or members of the Wellington Amateur Radio Club Inc, Branch 50 NZART wherever they live.

Modes

All modes CW, FM, RTTY, Packet, SSB, etc.

Bands

All Amateur bands HF and VHF. NOTE: Contacts on Branch 50 Sunday morning Net don't count towards the award.

Repeaters

Repeater contacts to count.

Endorsements

Endorsements on request for Band/Mode, etc.

Cost

Cost to be $5.00 per Award or six IRCs.

Administration

Contacts after April 1, 1992, will qualify and the Award will be issued by Wellington Amateur Radio Club Inc, Branch NZART, PO Box 6464, Wellington 6035, New Zealand.

Logs

Copy of log entries to Branch only. No need for them to be certified, QSLs are not needed.

Wairarapa Regional Award

This Award is sponsored by Branches 06, 46 and 82.

Requirements for Award: work eight counties, 12 towns, 15 postcodes, three lakes, four hospitals, eight rivers, two aerodromes, two lighthouses and 23 museums/historic places. The Award can be worked in three stages: basic, upgrade and final.

A check sheet for working the Award is available on written request with SASE, from the Custodian, R. A. Pearce ZL2GJ, *Call Book* address.

This Award may be worked on all bands and all modes starting from January 1, 1997. The "Basic" award costs $5.00. "Upgrade" and "Final" stickers are free on receipt of check sheet and SASE.

Waitara Branch Award

The Waitara Branch Award is available to amateurs and SWLs for contacts since January 1, 1986, with stations residing in the Waitara Branch area. Club station ZL2TO, 3 points; YLs and CW contacts 2 points; any other stations 1 point each. Each station to be worked once only. ZLs require 8 points. VKs require 6 points. DX stations 3 points. Repeater contact restricted to limited licence holders. Log with full QSO data with $3.00 to Alistair Herbert ZL2WOW, Mataro Road, Urenui, RD 45, Taranaki 4655.

Waitomo Award

Make 10 points with Branch 55 contacts as follows: VHF Simplex or CW, two points; VHF or UHF Repeater, 1 point; HF Phone, one point; HF CW, two points; VHF Satellite, two points; Club Station ZL1IZ, two points. Award is open to SWLs.

Log details and $2.00 to I. M. Howitt ZL1IZ, 15 Frederick Street, Otorohanga 2554.

Wanganui Award

For contacts since January 1 1982 with permanent residents in the Wanganui area—one point; with Wanganui-based Mobile stations regardless of location—one point; with ZL2JA—two points. Overseas stations require three points; ZLs require five points. (Repeater contacts acceptable.)

QSO details with $3.00 or five IRCs to Award Manager, 1 Caversham Road, Wanganui.

ZL1FND Far North Avocado Festival Award

This is an award that will run in conjunction with the Far North Avocado Festival held late February/early March each year. The award will run during the final week of the festival only.

The award is open to all radio amateurs, including overseas amateurs, and can be gained through contacts using 2 m, 70 cm (including repeaters and the National System) and the 80 m band.

Contact confirmation by way of the operator's log will be required and should be received by the Contest organizer by the end of April of the current year, together with the fee: New Zealand based operators, $5.00; overseas, NZ$6.00 equivalent (no IRCs please). Once the log has been confirmed the certificate will be posted to the claimant.

To gain the award the following points are required:

New Zealand operators	20
Overseas operators	10

One contact only with the Branch ZL1FND operator (compulsory)—5 points.

Contact with Branch President or Vice-President (will identify)—3 points.

Contact with any Branch 78 Committee member (will identify)—3 points.

Contact with any other Branch 78 member—2 points.

Dates and times, also frequencies (for HF) will be notified in the January/February *Break-In* each year.

Claims for the award to The Branch Secretary, PO Box 4, Awanui 0552, Far North, New Zealand.

New Zealand Women Amateur Radio Operators

WARO Award

General

Contacts may be any mode, any band or mixed, with applicants contacts all from the same QTH (except as in VHF Section), but contacts via repeaters, in WARO Nets or contests are not eligible. No QSLs required. Send full log details certified by one other licensed radio amateur to Custodian Carolyn Sarten ZL2JP, 212 Coronation Avenue, New Plymouth 4601, New Zealand with sufficient postage for return of award.

HF Section

ZL and VK stations work 12 WARO members resident in New Zealand, DX stations work six. Contacts to date from June 1 1969. Endorsement seals available to ZL and VK stations for each additional 12 contacts, DX stations six. Contacts with DX members of WARO qualify for endorsements but applications must contain at least three ZL contacts.

VHF Section

Ten VHF contacts with WARO members dating from January 1

1979. WARO members and/or applicants may be home station, mobile or portable. Endorsements for each additional five.

SWL Section

ZL and VK stations list 20 contacts heard with WARO members, DX list ten, dating from January 1 1979. List full log details with call-signs of both stations. Endorsements for each additional ten (five for DX stations).

NZWARO Century Award

1. Applications to contain full log details of contacts with 100 NZWARO members (DX members included) dating from June 1 1987, and to be signed by one other licensed radio amateur.

2. Contacts may be any mode, any band or mixed, and from any QTH, but each YL claimed must be a financial member of NZWARO at the time of the contact and may be counted once only.

3. Contacts made via repeaters and in nets will qualify and contest contacts made after June 1 1990 will be accepted.

4. No QSLs required. Send list of full log details and $2.00 to Custodian, Carolyn Sarten ZL2JP, 212 Coronation Avenue, New Plymouth 4601, New Zealand.

NZWARO Mountain Buttercup Award

1. For contacts with licensed NZWARO members, resident, visiting, mobile, etc, in the 60 towns named in the official list. WARO members working mobile, portable, etc may claim the relevant town for her own credit.

2. Basic award is available for list of 30 contacts with endorsement seals for each further five contacts up to the full 60 required. Applicants submitting a list of the full 60 valid contacts will receive a special endorsement making the award distinctive from those gained for the lesser number of contacts.

3. Contacts may be any mode, any band or mixed and made from any QTH, but each YL worked must be a financial member of NZWARO at the time of the contact and must be within a 25 km radius of the centre of the town claimed.

4. Contacts made via repeaters, in nets and in contests will qualify and the same WARO members may be contacted in any number of towns.

5. Award dates from January 1 1989. Send applications after 30 contacts containing full log details with the name of YL and town where worked, signed by one other radio amateur, together with $2.00 to Custodian Carolyn Sarten ZL2JP, 212 Coronation Avenue, New Plymouth 4601, New Zealand. An official list of towns required to be worked available from the custodian upon receipt of stamped addressed envelope. No QSLs required.

6. A different series of endorsement seals is available for each further ten contacts (after the basic 60) using the same list of towns. The same WARO members may be worked but each must be in a different town to where previously claimed. Please send SAE with endorsement applications.

North Island
1. Auckland
2. Dannevirke
3. Dargaville
4. Eketahuna
5. Featherston
6. Gisborne
7. Hamilton
8. Hawera
9. Helensville
10. Kaikohe
11. Kaitaia
12. Masterton
13. Matamata
14. Morrinsville
15. Napier
16. New Plymouth
17. Opotiki
18. Orewa
19. Otaki
20. Paihia
21. Palmerston North
22. Papakura
23. Putaruru
24. Rotorua
25. Taihape
26. Taumarunui
27. Taupo
28. Tauranga
29. Thames
30. Te Awamutu
31. Te Kuiti
32. Turangi
33. Upper Hutt
34. Waihi
35. Wairoa
36. Wanganui
37. Wellington
38. Wellsford
39. Whakatane
40. Whangarei

South Island
41. Alexandra
42. Ashburton
43. Balclutha
44. Blenheim
45. Christchurch
46. Cromwell
47. Dunedin
48. Gore
49. Greymouth
50. Hokitika
51. Invercargill
52. Kaikoura
53. Motueka
54. Nelson
55. Oamaru
56. Queenstown
57. Reefton
58. Timaru
59. Wanaka
60. Westport

Old Timers' Club

Old Timers' Award

Rules for the Award

Ten contacts with OTC (ZL) members, each contact worth one point, Phone or CW with an upgrade of 50 points.

The information required on each contact is: call-sign, date, time, name and OTC number. Contacts must be on or after launch date December 8, 1995.

Logs with remittance of $5.00 or IRCs to Bob Pearce ZL2GJ, *Call Book* address. Note that points may *not* be gained on the OTC National Net on Sunday mornings.

Overseas Awards

Note

1. There are hundreds of awards which are publicised in amateur radio periodicals throughout the world each month! Many are listed in RSGB publication Amateur Radio Awards (priced in UK £1.20) and several publications of DX Awards Guide by Chuck Ellis, priced about $7.00 to $8.00 each! CHC Directory of Awards has been revised and published by NZART member Scott Douglas KB7SB. This is a very comprehensive publication selling for about US$12.50 (check with NZART Awards Manager about these).

2. Most overseas awards can be certified by NZART Awards Manager so the QSLs don't have to be sent overseas BUT, always send a FULL checking list with all QSO data, etc., on which can be written the certification and which can be sent as the application. (ARRL Awards cannot be certified).

3. ALWAYS SEND SUFFICIENT RETURN POSTAGE for QSLs, etc. Print name and address on each sheet of paper used.

A-1 Operator Club

The basic aim of the A-1 Operator Club is to promote good operating in the amateur bands. To become a member one must be nominated by at least two operators who already belong. Every amateur should strive to merit nomination by following standard operating practice, by observing the rules of good Phone operation, and making his CW as clean and accurate as possible. An attractive certificate is awarded to each amateur who qualifies for membership. Note: This award is sponsored by the ARRL. Several ZL amateurs are members. Strive to merit nomination—you never know who may be listening. Similar awards are: TOPS; FOC; HSC.

WAC—Worked All Continents

Issued by IARU only through affiliated Societies. Applications from financial members of NZART only, must be made through the Awards Manager, accompanied by a checking sheet, QSL cards from the six continents, and return stamped envelope.

The following eight certificates are available: Basic (mixed mode), CW, Phone, SSTV, RTTY, FAX, Satellite and 5-band. In addition, the following endorsement stickers are available: QRP, 1.8 MHz, 3.5 MHz, 50 MHz, 144 MHz, any higher frequency band and 6-band. Contacts made on 10/18/24 MHz or via satellite are void for the 5-band certificate and 6-band sticker.

QRP is defined as five watts OUTPUT (10 W input) and QRP contacts must date on or after January 1 1985.

ZL applicants must be NZART members and enclose Break-In label with application.

There is NO charge.

RSGB Awards

For WBC, BCRTA, CDX, etc—SASE to NZART Awards Manager.

French Awards

For information on DDFM, DUF, DTA, DTC, DPE and other French Awards send an SASE to the NZART Awards Manager and include a 40 cent stamp. (Applicants for These Awards can be certified by NZART Awards Manager.)

ARRL Awards

WAS—Worked All States

Obtain the rules and application forms for WAS and 5BWAS by sending a business-size SAE and a few IRC to the ARRL Headquarters, 225 Main Street, Newington, CT 06111, USA.

DXCC—DX Century Club

*See "Countries List" in this *Call Book*.

Many endorsements etc. available—full reprint of rules (4 A4 sheets) from Awards Manager for $1.00.

NORTH ISLAND

NORTH ISLAND COUNTIES

1. Mangonui
2. Whangaroa
3. Holianga
4. Bay of Islands
5. Whangarei
6. Hobson
7. Otamatea
8. Rodney
9. Great Barrier Island
10. Waitemata
11. Franklin
12. Raglan
13. Waikato
14. Waipa
15. Otorohanga
16. Waitomo
17. Taumarunui
18. Coromandel
19. Thames
20. Hauraki Plains
21. Ohinemuri
22. Piako
23. Matamata
24. Tauranga
25. Rotorua
26. Taupo
27. Whakatane
28. Opotiki
29. Waiapu
30. Waikohu
31. Cook
32. Wairoa
33. Hawke's Bay
34. Waipawa
35. Patangata
36. Waipukurau
37. Dannevirke
38. Woodville
39. Clifton
40. Taranaki
41. Inglewood
42. Stratford
43. Egmont
44. Eltham
45. Waimate West
46. Hawera
47. Patea
48. Waimarino
49. Waitotara
50. Wanganui
51. Rangitikei
52. Kiwitea
53. Pohangina
54. Orua
55. Manawatu
56. Kairanga
57. Horowhenua
58. Hutt
59. Pahiatua
60. Akitio
61. Eketahuna
62. Masterton
63. Waiarapa South
64. Featherston

SOUTH ISLAND

SOUTH ISLAND COUNTIES

65. Marlborough
66. Awatere
67. Kaikoura
68. Golden Bay
69. Waimea
70. Buller
71. Inangahua
72. Grey
73. Westland
74. Amuri
75. Cheviot
76. Waipara
77. Kowai
78. Ashley
79. Rangiora
80. Eyre
81. Oxford
82. Tawera
83. Malvern
84. Paparua
85. Waimairi
86. Heathcote
87. Halswell
88. Mount Herbert
89. Akaroa
90. Chatham Islands
91. Wairewa
92. Ellesmere
93. Ashburton
94. Geraldine
95. Levels
96. Mackenzie
97. Waimate
98. Waitaki
99. Waihemo
100. Waikouaiti
101. Peninsula
102. Taieri
103. Bruce
104. Clutha
105. Tuapeka
106. Maniototo
107. Vincent
108. Lake
109. Southland
110. Wallace
111. Fiord
112. Stewart Island

ARDF AMATEUR RADIO DIRECTION FINDING

What is ARDF?

In simple terms ARDF is looking for a transmitter. In IARU Region III ARDF is played on 80 m and 2 m

The competition would normally be in a rural area, preferably wooded valleys. Within this area are placed five transmitters that have to be found by the competitors. A sixth transmitter is usually provided at the finish line to help lost competitors find their way home.

Each transmitter will be keying a unique identification code in the form MOE, MOI, MOS, MOH, MO5. On VHF this will be MCW and CW on HF. These correspond to transmitters numbered one through five.

At the competition there may be several classes of competitor, not all classes are required to find all the transmitters.

Contestants are free to find the transmitters in any order they wish.

There is a time limit set for the course. Any competitor who has not finished within this time is disqualified. This time limit is set by the organizing group and takes into account the number of competitors, the terrain and the length of the course. IARU Region III rules recommends that it should be 100 to 140 minutes for a 4–7 km course.

The five transmitters on the course operate sequentially on a common frequency. Each transmitter will operate for one minute and then be silent for four minutes, during which the other four transmitters will operate.

In ARDF the transmitters are not usually "hidden", and in fact a competitor is only required to find the control point, which will be within 2 m of the transmitter. Figure 1 shows a typical control point.

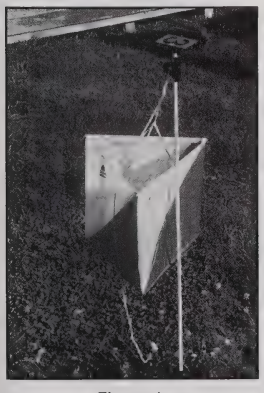


Figure 1.

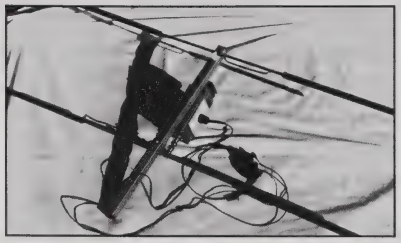


Figure 3.

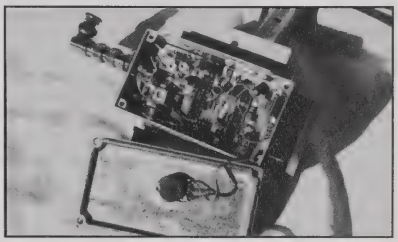


Figure 4.

Included at the control point is a "punch" that is used to mark your card to prove that you have visited the control point.

At each transmitter a referee will be sited to ensure there is no collusion between competitors as ARDF is an individual sport. Also the referee will ensure there is no "foul play", etc.

The "winner" of the event is the competitor who finds the most number of transmitters for their class in the shortest time.

What is needed to participate?

That depends a bit on you and on the course. It is possible to use a simple handheld. Any form of directional aerial can be used for ARDF, additionally an attenuator and a method of accurately determining signal strength would be useful.

As the level of competition becomes "keener" your equipment needs to become more refined. There are a number of commercial receivers available at a range of prices. Most of these receivers provide attenuators to cover a wide dynamic range and audible and visual strength indicators.

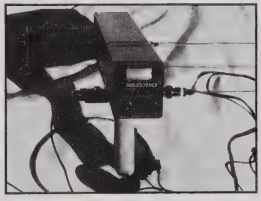


Figure 2.

Figure 2 shows a Japanese ARDF receiver. This is an excellent commercial design packed full of features. The unit is available from Apex Communications.[1]

A full set of equipment is available from Australia from Ron Graham.[2] Figures 3 and 4 are a couple of view of Ron Graham's VHF receiver. This is an AM dual conversion superhet based on the MC6632 chip. It is tuneable over the bottom part of 2 m and includes an audio signal strength indicator. The antenna is a modified HB9V.

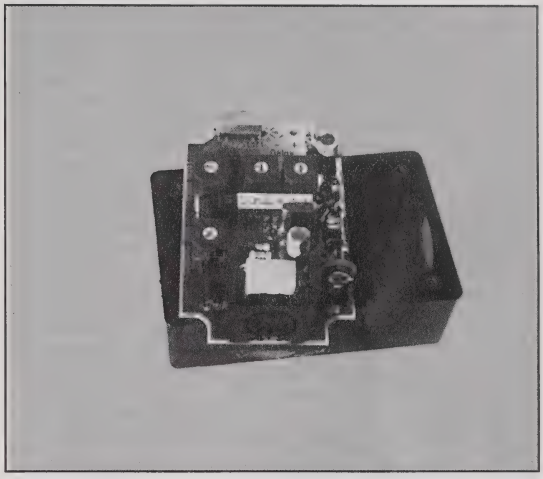


Figure 5.

The Auckland VHF Group[3] has available a microprocessor key that will meet most requirements (Figure 5). This was designed to interface with handhelds to provide Clubs with a quick and easy way to provide VHF ARDF transmitters. It also includes an output for keying a 80 m transmitter.

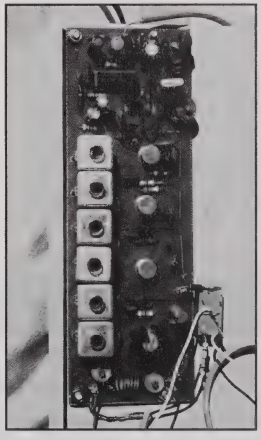


Figure 6.

Figure 6 shows a typical 2 m transmitter that can be used as the hidden transmitter.

How fit do I need to be?

If you can walk 5 km then you will be able to compete in club events with a degree of success.

As the level of competition increases, so must your physical "prowess". To become a Regional or World Champion you should expect to become very much more athletic.

For most people there is a great amount of participation and fun that can be had between these two extremes.

Happy ARDF

References

1. Dave Walker, Apex Communications, Napier. Telephone (06) 876-5014.

2. Ron Graham Electronics, Box 323, Sarina, Queensland 4737, Australia.

3. Auckland VHF Group, Box 10-138, Dominion Road, Auckland 1030.

One of the many facets of Amateur Radio is operating in a contest. This is basically attempting to make as many contacts as possible in a given length of time. Depending on the rules of the specific contest, those contacts may be on one band, or all the bands (generally WARC bands excluded) and the mode can be Phone, CW or Digital. In most overseas contests, only one contact with each station on each band is permitted during the contest period. However, in New Zealand, due to the relatively low number of amateur radio operators in the country, the total contest operating time is often broken into contest periods, typically of one hour. The same station can be worked in each new period. This helps to keep the level of interest and activity up on the bands.

For the newcomer to contests, getting started requires nothing more than to read the rules for the particular event and after establishing contact with another participant in the appropriate or chosen mode, exchange the required information. This exchange of information usually includes an RS(T) report and a number starting with 001 and increasing by one for each contact. This incrementing number is by no means the only method used and other reports may require your *CQ* or ITU Zone Number, your age, your name or your NZART Branch number. The idea is to generate a report that can be verified by the receiving station and therefore complete the QSO.

There are basically two operating methods

Running—select a clear frequency (if possible), call CQ Contest on phone or CQ Test on CW and answer all callers.

Search and Pounce—tune the band(s) in use and answer each CQ you hear being called.

It goes without saying that a station with efficient antennas is going to be hard to beat, but even with a simple dipole, very good results can be obtained. After a few attempts, the incentive to improve antennae, equipment and operating skills will be great.

Another way to break into contest operating is to join a group that participates in contests such as Branch teams in the Jock White Memorial Field Day Contest or groups that take part in international contests, such as the group at Auckland Contest Group or the Kiwi Contest Group and Quartz Hill Group in Wellington. These groups tend to take part particularly in the premier international contest—the *CQ* World Wide SSB and CW contests on the last weekends of October and November. These contests are sponsored by *CQ* ham radio magazine, which also sponsors other contests.

To make closer contact with our neighbours across the Tasman, participation in a number of Australian contests is encouraged. Some of the Australian sponsored contests are; the John Moyle Memorial Field Day—third full weekend of March, Pacific 160 m Contest—third Saturday in July 0700–2300, Remembrance Day Contest—weekend nearest 15 August 0800 Saturday–0800 Sunday.

Some of the contests organised by NZART

Jock White Memorial Field Day

Usually held over the last weekend of February each year, this is primarily a Branch effort on the 40 and 80 m bands. Modes are Phone and CW.

Sangster Shield Contest

Held in May, this is a low power, 80 m, CW only event. There are a number of classes, and also a class for newly licensed operators.

Memorial Contest

Held on the first weekend in July each year, in memory of those of our ranks who lost their lives in the World Wars. This is an 80 m contest, with classes for both Phone, CW and an Open section (Phone and CW combined).

VK-ZL-Oceania Contest

This international contest is run on alternative years with the Wireless Institute of Australia. It runs for a 24 hour period, and the Phone section is held over the first weekend in October each year, while the CW section is held on the second weekend. All (non WARC) bands may be used.

Other contest events on the New Zealand calendar include a frequency measurement contest, a contest organised by WARO, an event where old time or WW II equipment is used, VHF and UHF contests and a CW event where other than normal keying may be used. The Western Suburbs Branch organises annual Phone and CW sprints of one hour's duration each.

The Contest Calendar in *Break-In* lists the contests for the coming months and gives full details of the more popular events, while brief summaries of interest may be given.

Contesting, Internet and logging

The Internet is very complementary to amateur radio in many of the facets of the hobby and this certainly applies to contesting. There are many sites dedicated to contests, most with links to other contest and allied sites such as DXing, software etc. There are several contest calenders which list all of the international contests month by month with links to the particular contest rules, previous years results, high scores etc. Some of the announced DXpedition web pages list the DXpedition stations that have announced activity in a particular worldwide contest.

Other web sites have tools and aids for contesting such as logging programmes like CT, TR etc., programs for practising phone and CW pileups, reflectors where discussions and stations claimed scores are listed. A logging program used by many is CT by K1EA. The program can be purchased from the USA and can be updated as changes are made periodically. For example the DXCC list is changed periodically and the countries list in CT can be updated with a file from the web.

Logging programs ease the logkeeping chore once keyboard skills are obtained, and provide many features to facilitate contest operating. The main worldwide and USA contests plus DXpedition mode can be selected within CT and TR. The DXpedition mode can be used as a home station log. These logging programmes cater for phone and CW operation with the "F" and other general keys being used for CQing, sending the exchange etc. The CW speed can be varied. TR by N6TR has two modes "Running" (CQing) and "Search and Pounce".

The programmes also offer QSL printing, interconnection with DX clusters and frequency changing of tranceivers to DX spots. New features are added periodically. CT versions have progressed up to version 9—and versions 8 and 9 require a 386 PC or better. Earlier versions ran on a 286.

Some of the many websites related to contesting are

Contest Calenders

www.sk3bg.se/contest/index.htm

www.arrl.org/contests

www.hornucopia.com/contestcal/

www.hamradio.de/contest

CT Log Programme

www.k1ea.com

KA9FOX Contest Score Rumours

www.qth.com/ka9fox/scores.shtml

CQ Worldwide Contests

www.cqww.com

Contest Resources and Information

www.contesting.com

www.qsl.net/cwsp/k1ar92e.htm

Announced DXpeditions

www.usats.com/ce-dx.html

As Contest Manager, I am only too happy to provide full information on almost any contest held world-wide. Enclose a self-addressed, stamped envelope with your request.

Contests can be fun. Give it a go.

WORLD HF CONTEST CALENDAR

Key to table overleaf:
M = Multimode; PH = Phone; CW = CW; R = RTTY, * = not continuous. All times are UTC.

Most international contest dates are co-ordinated on a worldwide basis by the IARU, but local events can be influenced by moveable dates such as Easter. It pays to check the rules and dates with the organisers - just to be sure.

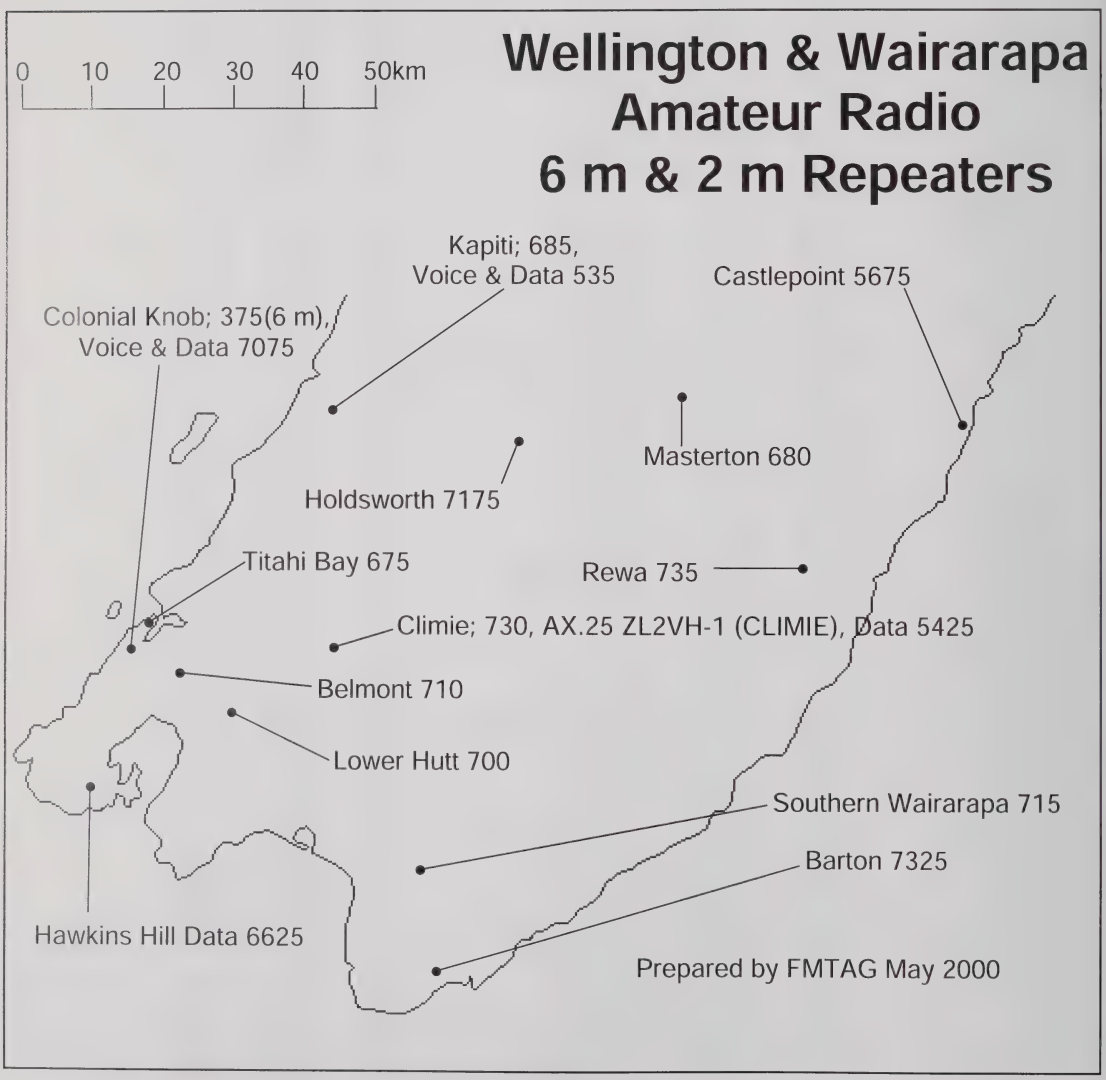
Contest		Sponsor	Weekend	Times
January				
R	CQ/RJ WW RTTY WPX	CQ Magazine/RTTY	Second full	Saturday 0000–Sunday 2400
CW	HA-DX	MRASZ (Hungary)	Third full	Saturday 0000–Sunday 2400
CW	CQ WW 160	CQ Magazine	Last full	Friday 2200–Sunday 1600
PH	Belgium DX	UBA	Last full	Saturday 1300–Sunday 1300
CW	French DX	REF	Last full	Saturday 0600–Sunday 1800
February				
M	PACC	VERON (Netherlands)	Second	Saturday 1200–Sunday 1200
CW	ARRL-DX	ARRL	Third full	Saturday 0000–Sunday 2400
R	BARTG	BARTG	Third full	Saturday 0200–Monday 0200
CW	7 MHz CW	RSGB	Last full	Saturday 1500–Sunday 0900
PH	CQ WW 160	CQ Magazine	Last full	Friday 2200–Sunday 1600
PH	French DX	REF	Last full	Saturday 0600–Sunday 1800
CW	Belgium DX	UBA	Last full	Saturday 1300–Sunday 1300
March				
PH	ARRL-DX	ARRL	First full	Saturday 0000–Sunday 2400
CW	Commonwealth	RSGB	Second full	Saturday 1200–Sunday 1200
R	BARTG	BARTG	Third full	Saturday 0200–Monday 0200
M	Russian DX	SRR	Third full	Saturday 1200–Sunday 1200
PH	CQ WPX	CQ Magazine	Last full	Saturday 0000–Sunday 2400
April				
PH	SP-DX	PZK (Poland)	First full	Saturday 1500–Sunday 1500
M	YU-DX	Yugoslavia	Third full	Saturday 1200–Sunday 1200
M	Helvetia	USKA (Switzerland)	Last full	Saturday 1300–Sunday 1300
May				
M	ARI International DX	ARI (Italy)	First full	Saturday 2000–Sunday 2000
M	VOLTA WW	ARI	Second full	Saturday 1200–Sunday 1200
M	CQ-M	Krenkel CRC (Russia)	Second full	Saturday 2100–Sunday 2100
CW	CQ WPX	CQ Magazine	Last full	Saturday 0000–Sunday 2400
June				
CW	WW-South America	LABRE (Brazil)	Second full	Saturday 0000–Sunday 1600
PH	TOEC WW Grid	TOEC (Sweden)	Second full	Saturday 1200–Sunday 1200
PH	All Asia	JARL	Third full	Saturday 0000–Sunday 2400
CW	IV Marconi Memorial	ARI (Italy)	Fourth full	Saturday 1400–Sunday 1400
July				
PH	Venezuelan Independence	RCV	First full	Saturday 0000–Sunday 2400
M	IARU Championships	IARU/ARRL	Second full	Saturday 1200–Sunday 1200
CW	SEANET-DX	SEANET	Third full	Saturday 0000–Sunday 2400
PH	IOTA Contest	RSGB	Last full	Saturday 1200–Sunday 1200
CW	Venezuelan Independence	RCV	Last full	Saturday 0000–Sunday 2400
R	Russian RTTY	Russia	Last full	Saturday 0000–Sunday 2400
August				
M	YO-DX	FRR (Romania)	First Sunday	Sunday 0000–Sunday 2000
CW	WAE-DX	DARC (Germany)	Second full	Saturday 0000–Sunday 2400
R	SARTG WW RTTY	SARTG (Scandinavia)	Second full	Saturday 0000–Sunday 1600*
PH	SEANET-DX	SEANET	Third full	Saturday 0000–Sunday 2400
CW	TOEC WW Grid	TOEC (Sweden)	Fourth full	Saturday 1200–Sunday 1200
September				
CW	All Asia	JARL	First full	Saturday 0000–Sunday 2400
PH	WAE-DX	DARC (Germany)	Second full	Saturday 0000–Sunday 2400
CW	SAC	Scandinavia	Third full	Saturday 1500–Sunday 1800
PH	SAC	Scandinavia	Fourth full	Saturday 1500–Sunday 1800
R	CQ/RJ WW RTTY	CQ Magazine/RTTY	Last full	Saturday 0000–Sunday 2400
October				
PH	RSGB 21/28 MHz	RSGB	First Sunday	Sunday 0700–Sunday 1900
PH	VK-ZL-Oceania	WIA/NZART	First full	Saturday 1000–Sunday 1000
CW	VK-ZL-Oceania	WIA/NZART	Second full	Saturday 1000–Sunday 1000
M	Worked ALL Germany	DARC	Third full	Saturday 1500–Sunday 1500
CW	RSGB 21/28 MHz	RSGB	Third Sunday	Sunday 0700–Sunday 1900
PH	CQ World-Wide	CQ Magazine	Last full	Saturday 0000–Sunday 2400
November				
CW	Ukranian DX	Ukraine	First full	Saturday 0000–Sunday 2400
M	OK/OM-DX	Czech Republic	Second full	Sunday 0000–Sunday 2400
R	WAE RTTY	DARC (Germany)	Second full	Sunday 0000–Sunday 2400
CW	LZ-DX	Bulgaria	Third full	Saturday 1200–Sunday 1200
CW	CQ World-Wide	CQ Magazine	Last full	Saturday 0000–Sunday 2400
December				
CW	ARRL 160m	ARRL	First full	Friday 2200–Sunday 1600
M	ARRL 10m	ARRL	Second full	Saturday 0000–Sunday 2400
CW	Croation	HRS	Third full	Saturday 1400–Sunday 1400

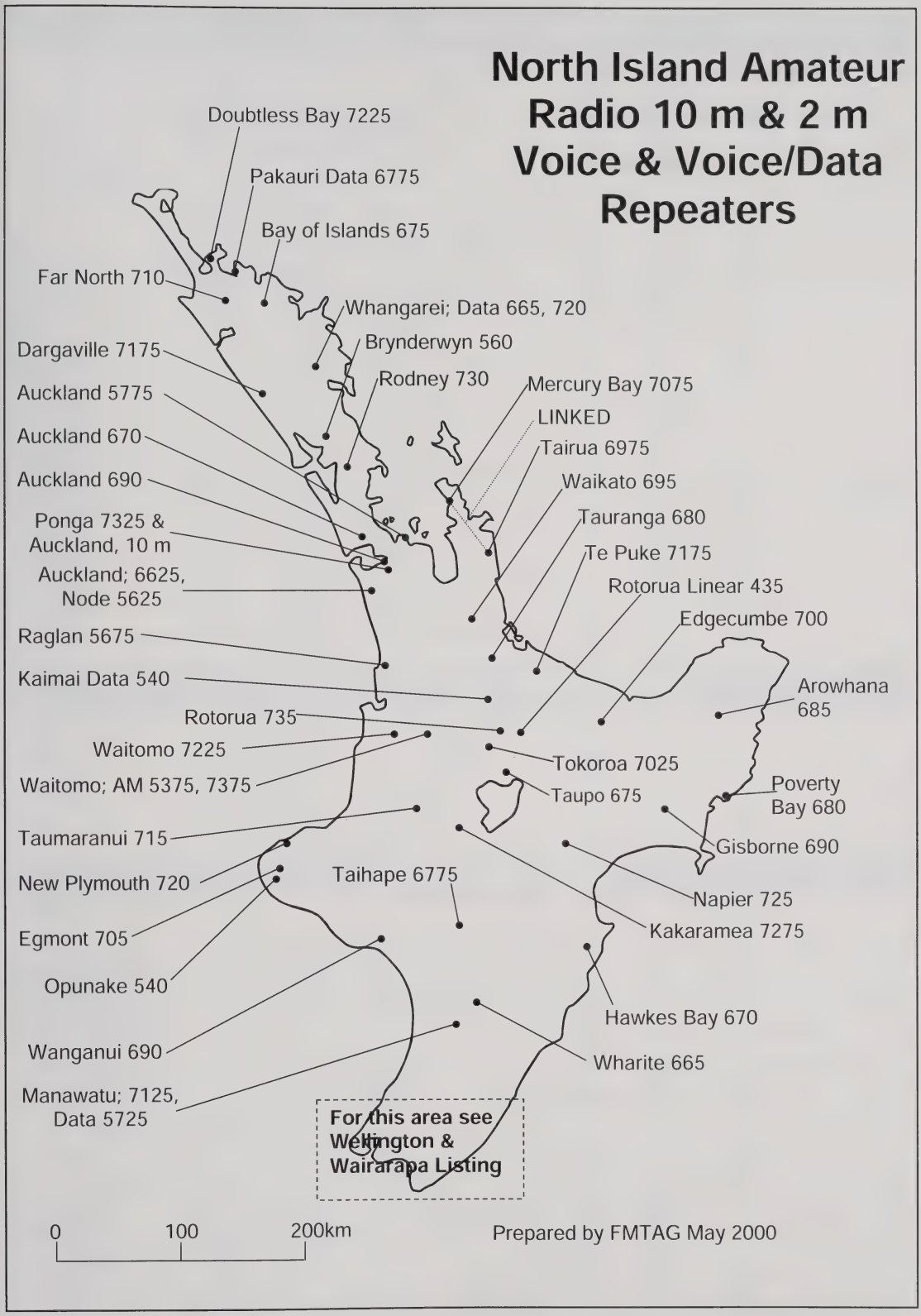
CONTEST UPDATE NOTES

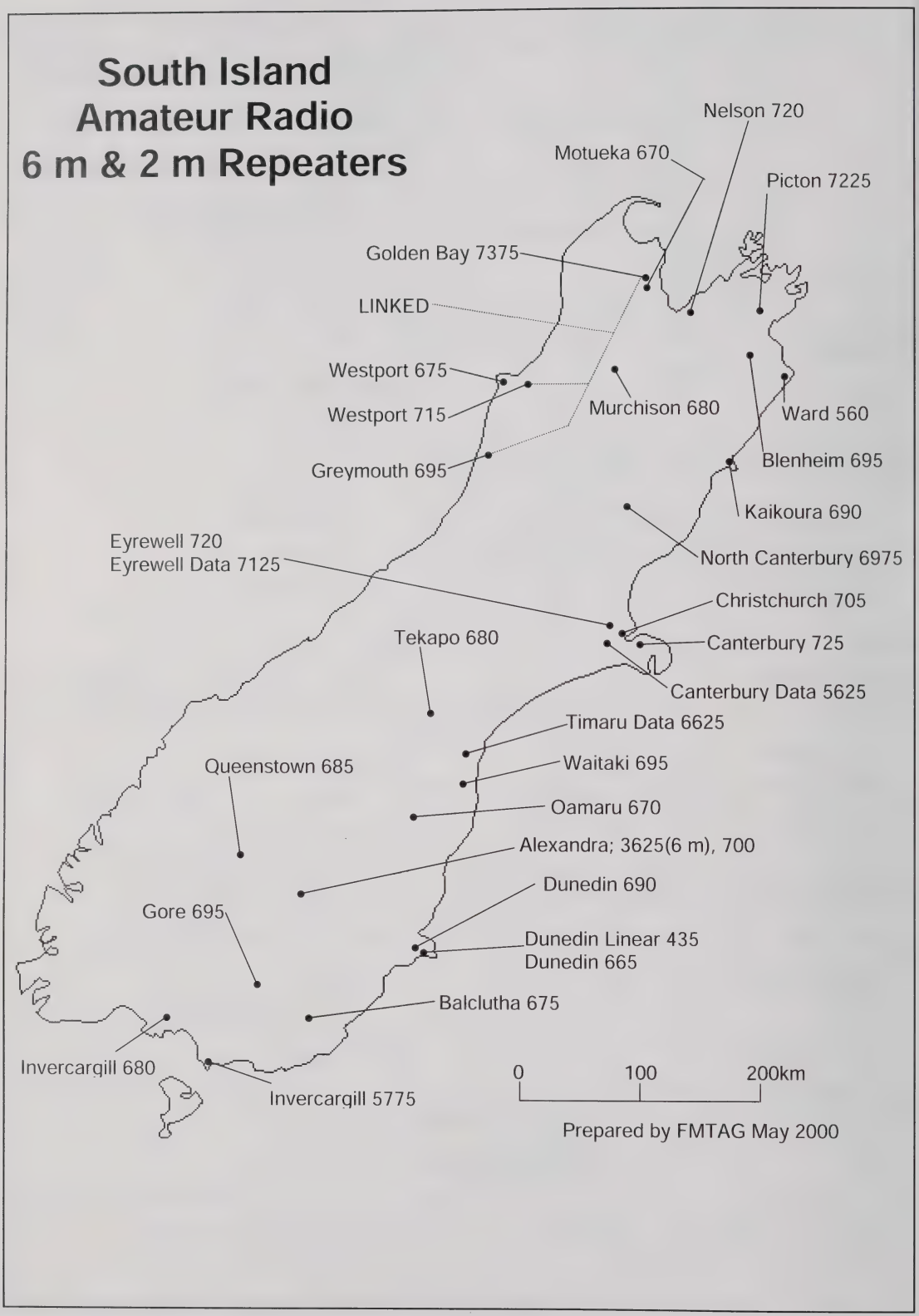
VHF REPEATERS

Station Name	Output Frequency	Map 260	Map Name	Branch Number	Trustee 1	Trustee 2	Notes
10 m Repeaters							
(Receive offset –100 kHz—user transmits LOW. No tone required, no time out used and vertical polarization)							
Auckland 10 m	29.6400	R12 743543	Ponga Hill, Papakura	86	ZL1UDD	ZL1BFB	
6 m Repeaters							
(Receive offset –1 MHz—user transmits LOW. No tone required, no time out used and vertical polarization)							
Alexandra 3625	53.6250	G42 141336	Fruitlands	61	ZL4THT	—	
Colonial Knob 375	53.7500	R27 614043	Colonial Knob	74	ZL2BC	ZL2TFZ	5
2 m Repeaters							
(Receive offset: –600 kHz for O/P Freq 145.325–147.000 Mhz—user transmits LOW. +600 kHz for O/P Freq 147.025–147.375 MHz—user transmits HIGH. No tone required, no time out used and vertical polarisation)							
Alexandra 700	147.0000	G42 141336	Fruitlands	61	ZL4THT	—	
Arowhana 685	146.8500	Y16 362319	Arowhana	11	ZL2IMM	ZL2QK	3
Auckland 5775	145.7750		Musick Point	86	ZL1UDD	ZL1BFB	
Auckland 6625	146.6250	R13 705258	Port Waikato	66	ZL1TTH	ZL1DDL	
Auckland 670	146.7000	Q11 488742	Ruaotewhenua	66	ZL1TND	ZL1TTH	
Auckland 690	146.9000	R12 890433	Mt Puketutu	66	ZL1UET	—	
Balclutha 675	146.7500	G46 295350	Kuriwao	35	ZL4TLL	—	
Barton 7325	147.3250	S28 046591	Mt Barton	46	ZL2BFY	ZL2BFU	3
Bay of Islands 675	146.7500	P05 844655	Manginangina	84	ZL2BER	ZL1AVW	
Belmont 710	147.1000	R27 670014	Belmont	74	ZL2ARW	ZL2TFZ	
Blenhein 695	146.9500	P28 867510	The Ned	22	ZL2BK	ZL2BAY	3
Brynderwyn 560	145.6000	Q08 383694	Pilbrow Hill	66	ZL1UOH	—	
Canterbury 725	147.2500	M36 892243	Herbert Peak	05	ZL3ADF	—	3
Castlepoint 5675	145.6750	U26 820346	Whakataki	46	ZL2BFY	ZL2UCW	
Christchurch 705	147.0500	M36 801322	Marleys Hill	05	ZL3ADF	—	
Climie 730	147.3000	R27 898041	Mt Climie	63	ZL2TNG	ZL2DX	
Colonial Knob Voice and Data 7075	147.0750	R27 614043	Colonial Knob	74	ZL2BC	ZL2TFZ	1
Dargaville 7175	147.1750	P07 843963	Pukewhararikl	73	ZL1TVP	ZL1BAU	
Doubtless Bay 7225	147.2250	O03 465034	Whatuwhiwhi	78	ZL1BG	ZL1UVR	
Dunedin 665	146.6500	I44 231778	Karetai Road, Highcliff	30	ZL4TJH	ZL4TGR	
Dunedin 690	146.9000	I44 199854	Mt Cargill	30	ZL4TJH	ZL4TGR	
Dunedin Linear 435	144.3500	I44 200776	Highcliff Road	30	ZL4TJH	ZL4TGR	3
Edgecumbe 700	147.0000	V16 378374	Mt Edgecumbe	51	ZL1TKL	ZL1BGE	
Egmont 705	147.0500	P20 053104	East Egmont, Jackson's Lookout	54	ZL2AFE	ZL2WJM	
Eyrewell 720	147.2000	M35 552533	Fire Lookout Tower	CARDS	ZL3MJS	ZL3TCK	3
Far North 710	147.1000	O04 536707	Mt Maungataureia	78	ZL1FC	ZL1BG	
Gisborne 690	146.9000	X18 095514	Whakapunake	11	ZL2IMM	ZL2QK	
Golden Bay 7375	147.3750	N26 983203	Takaka Hill	24	ZL2BCG	ZL3AAA	2 Westport 715
Gore 695	146.9500	F45 898551	McLeods Hill	08	ZL4AO	ZL4TCD	3
Greymouth 695	146.9500	K31 733651	Sewell Peak	49	ZL3ADH	ZL3TY	2 Westport 715
Hawkes Bay 670	146.7000	V22 415495	Kahuranaki	13	ZL3DK	ZL2AM	
Holdsworth 7175	147.1750	S26 137342	Mt Holdsworth	46	ZL2BFU	ZL2BFY	3
Invercargill 5775	145.7750	E47 525895	Bluff Hill	37	ZL4OX	ZL4TFJ	
Invercargill 680	146.8000	D46 109367	Bald Hill, Otautau	37	ZL4OX	ZL4TFJ	
Kaikoura 690	146.9000	O31 676646	Kaikoura Peninsula	76	ZL3PZ	ZL3DR	
Kakaramea 7275	147.2750	T19 436442	Kakaramea	38	ZL1AO	ZL1UTH	3
Kapiti 685	146.8500	R26 875374	Mt Field	69	ZL2GO	ZL2TUV	
Kapiti Voice & Data 535	145.3500	R26 875374	Mt Field	69	ZL2GO	ZL2TUV	1
Lower Hutt 700	147.0000	R27 742968	Mt Fitzherhert	18	ZL2UKV	ZL2TWS	
Manawatu 7125	147.1250	T24 418852	Pahiatua Track	20	ZL2AUB	ZL2FX	
Masterton 680	146.8000	T26 406366	Mt Rangitumau	46	ZL2UCW	ZL2BFY	
Mercury Bay 7075	147.0750	T11 367772	2.5 km North of Kakatarahae	85	ZL1AAF	ZL1CWN	
Motueka 670	146.7000	N27 976092	Mt Campbell	24	ZL2BCG	ZL3AAA	
Murchison 680	146.8000	M29 682416	Mt Murchison	26	ZL2BCA	-	
Napier 725	147.2500	V19 333234	Taraponui	25	ZL3DK	ZL2IA	
Nelson 720	147.2000	O27 461922	Saddle Hill	26	ZL2BCA	-	3
New Plymouth 720	147.2000	P19 990382	Power Station Chimney	27	ZL2BZH	-	
North Canterbury 6975	146.9750	M33 602152	Mt Noble	68	ZL3QR	ZL3CE	3
Oamaru 670	146.7000	I40 169030	Station Peak	64	ZL4SF	ZL4SN	
Opunake 540	145.4000	P20 961014	Opunake	32	ZL2ADU	ZL2BQW	
Picton 7225	147.2250	P27 916894	Mt Freeth	22	ZL2BK	ZL2BAY	2, 3
Ponga 7325	147.3250	R12 886529	Ponga Hill, Papakura	86	ZL1UDD	ZL1BUP	
Poverty Bay 680	146.8000	Y18 477679	Kaiti Hill, Gisborne	11	ZL2IMM	ZL2QK	
Queenstown 685	146.8500	F41 790626	Double Cone	75	ZL4JW	-	3
Raglan 5675	145.6750	R15 826651	Plateau Road	81	ZL1THG	ZL1TAT	3
Rewa 735	147.3500	T26 606122	Mt Rewa	46	ZL2UCW	ZL2BFU	
Rodney 730	147.3000	R09 558397	Conical Hill Road Dome Valley	71	ZL1MO	ZL1BKD	3
Rotorua 735	147.3500	U16 905378	Mt Ngongotaha	33	ZL1AKC	ZL1PJ	
Rotorua Linear 435	144.3500	U16 068393	Whakapoungakau Airstrip	33	ZL1BTB	ZL1PJ	3, 5

Station Name	Output Frequency	Map 260	Map Name	Branch Number	Trustee 1	Trustee 2	Notes
Southern Wairarapa 715	147.1500		Long Ridge Farm, The Knoll	82	ZL2LL	—	
Taihape 6775	146.7750	T21 446632	Cleavers Hill	23	ZL2TRY	ZL2JOE	
Tairua 6975	146.9750	T11 609661	Tairua Lookout	85	ZL1AAF	ZL1ALS	
Taumarunui 715	147.1500	S18 086672	Hikurangi	38	ZL1AO	ZL1UTH	
Taupo 675	146.7500	U17 736942	Mt Maroanui	60	ZL1BVO	ZL2JE	
Tauranga 680	146.8000	U14 856839	Cambridge Road (Reservoir)	39	ZL1AFC	ZL1QI	
Te Puke 7175	147.1750	U15 972630	Shaw Road Trig	53	ZL1KRH	ZL3GR	
Tekapo 680	146.8000	I38 192691	Mt Rollesby	34	ZL3TGR	—	
Titahi Bay 675	146.7500	R27 654094	Onepoto Reservoir	42	ZL1VD	ZL2AEL	
Tokoroa 7025	147.0250	T16 630103	5km Nth Whakamaru	57	ZL1TDV	ZL1UGH	3
Waikato 695	146.9500	T13 526039	Mt Te Aroha	81	ZL1THG	ZL1TAT	
Waitaki 695	146.9500	J40 452147	Mt Studholme	34	ZL3TGR	ZL3UR	
Waitomo 7225	147.2250	R16 846159	Waipuna Road	55	ZL4SQ	ZL1HJ	5
Waitomo 7375	147.3750	S16 214123	Rangitoto Range	55	ZL1BZ	ZL1THG	
Waitomo AM 5375	145.3750	S16 214123	Rangitoto Range	81	ZL1THG	—	
Wanganui 690	146.9000	S21 064641	Maewa Bench Mark	48	ZL2BGE	ZL2TDI	
Ward 560	145.6000	P29 072281	Weld Cone	22	ZL2BK	ZL2BAY	
Westport 675	146.7500	K29 824386	Cape Foulwind Lighthouse	62	ZL3VC	ZL3TKC	3
Westport 715	147.1500	L29 140441	Mt Frederick	62	ZL3VC	ZL3TKC	3,2 Golden Bay 7325 and Greymouth 695
Whangarei 720	147.2000	Q07 317090	Mt Parahaki	28	ZL1UOH	ZL1ANI	
Wharite 665	146.6500	T23 530018	Wharite	06	ZL2VL	ZL1AFZ	




North Island Amateur Radio 10 m & 2 m Voice & Voice/Data Repeaters
Doubtless Bay 7225
Pakauri Data 6775
Bay of Islands 675
Far North 710
Whangarei; Data 665, 720
Brynderwyn 560
Dargaville 7175
Rodney 730
Mercury Bay 7075
Auckland 5775
LINKED
Auckland 670
Tairua 6975
Auckland 690
Waikato 695
Tauranga 680
Ponga 7325 & Auckland, 10 m
Te Puke 7175
Auckland; 6625, Node 5625
Rotorua Linear 435
Edgecumbe 700
Raglan 5675
Kaimai Data 540
Arowhana 685
Rotorua 735
Waitomo 7225
Tokoroa 7025
Waitomo; AM 5375, 7375
Taupo 675
Poverty Bay 680
Taumaranui 715
Gisborne 690
New Plymouth 720
Taihape 6775
Napier 725
Kakaramea 7275
Egmont 705
Opunake 540
Hawkes Bay 670
Wanganui 690
Wharite 665
Manawatu; 7125, Data 5725
For this area see Wellington & Wairarapa Listing
0
100
200km
Prepared by FMTAG May 2000


South Island
Amateur Radio
6 m & 2 m Repeaters
Nelson 720
Motueka 670
Picton 7225
Golden Bay 7375
LINKED
Westport 675
Westport 715
Murchison 680
Ward 560
Greymouth 695
Blenheim 695
Kaikoura 690
Eyrewell 720
Eyrewell Data 7125
North Canterbury 6975
Christchurch 705
Tekapo 680
Canterbury 725
Canterbury Data 5625
Timaru Data 6625
Queenstown 685
Waitaki 695
Oamaru 670
Alexandra; 3625(6 m), 700
Dunedin 690
Gore 695
Dunedin Linear 435
Dunedin 665
Balclutha 675
Invercargill 680
Invercargill 5775
0
100
200km
Prepared by FMTAG May 2000

70 cm REPEATERS

(Receive offset –5 MHz-user transmits LOW. No tone required, no time out used and vertical polarisation. Not including the National System repeaters)

Station Name	Output Frequency	Map 260	Map Name	Branch Number	Trustee1	Trustee2	Note
Auckland 845	438.4500	R13 705258	Port Waikato	66	ZL1TTH	ZL1DDL	
Auckland 850	438.5000	R11 677788	Auckland City	66	ZL1UET	-	
Cass Peak 850	438.5000	M36 793309	Cass Peak	56	ZL3ACS	ZL3ADL	
CH CH VHF DX Group Phone Patch (input 144.180/88.5 Hz)	438.8000	M36 778362	Christchurch	CHVHF	ZL3TCV	ZL3TIC	
Colonial Knob 855	438.5500	R27 614043	Colonial Knob	74	ZL2BC	ZL2TFZ	
Dunedin 915	439.1500	I44 199854	Mt Cargill	30	ZL4TJH	ZL4TGR	
Egmont 880	438.8000	P20 053104	East Egmont, Jackson's Lookout	54	ZL2AFE	ZL2WJM	
Greymouth 8575	438.5750	K31 733651	Sewell Peak	49	ZL3TY	ZL3ADH	
Hawkes Bay 870	438.7000	V22 448603	Te Mata Peak	25, 13	ZL3DK	ZL2BDQ	2 Wharite 665
Hunua 895	438.9500	R12 895578	Clements Hill, Papakura	65	ZL1BNQ	ZL1MR	
Invercargill 870	438.7000	E46 523116	Civic Admin. Blg. Esk St.	37	ZL4OX	ZL4TFJ	
Invercargill 890	438.9000	E46 528108	Branch 37 Clubrooms	37	ZL4OX	ZL4TFJ	
Kapiti 885	438.8500	R26 875374	Mt Field	69	ZL2GO	ZL2TUV	
Manawatu 8525	438.5250	T24 418852	Pahiatua Track	20	ZL2AUB	ZL2FX	
Manawatu Voice and Data 920	439.2000	T23 528015	Wharite	20	ZL2VL	ZL1AFZ	1
Manurewa 8575	438.5750	R11 805664	Redoubt Rd. Manukau	86	ZL1UET	ZL1UDD	
Mount Victoria 850	438.5000	R27 605886	Mt Victoria	74	ZL3TCE	ZL2TAR	
Nelson 890	438.9000	O27 366886	Fringed Hill	26	ZL2BCA	-	
New Plymouth 8475	438.4750	P19 043375	Taranaki Polytechnic	27	ZL2BZH	-	
North Canterbury 870	438.7000	M33 602152	Mt Noble	68	ZL3QR	ZL3CE	3
Oamaru 865	438.6500	J41 495667	Oamaru	64	ZL4SF	ZL4SN	
Ponga 825	438.2500	R12 886529	Ponga Hill, Papakura	86	ZL1UDD	ZL1BUP	
Taihape 865	438.6500	T21 446632	Cleavers Hill	23	ZL2TRY	ZL2JOE	
Tapuae 8575	438.5750	T22 425311	Tapuae	70	ZL2FX	ZL2UKW	
Taraponui 8425	438.4250	V19 333234	Taraponui	25, 13	ZL2IA	ZL3DK	
Tauranga 885	438.8500	U14 994798	Papamoa	39	ZL1BJP	ZL1QI	3
Te Puke 855	438.5500	U15 972630	Shaw Road Trig	53	ZL1KRH	ZL3GR	
Timaru 885	438.8500	J37 559434	Mt Horrible	34	ZL3TGR	-	ZL3UR
Tokoroa 865	438.6500	T16 630103	5 km North Whakamaru	57	ZL1TDV	ZL1UGH	3
Waikato 840	438.4000	T13 526039	Mt Te Aroha	81	ZL1THG	ZL1TAT	
Waitomo 870	438.7000	S16 214123	Rangitoto Range	55	ZL1BZ	ZL1THG	
Westport 855	438.5500	L29 140441	Mt Frederick	62	ZL3VC	ZL3TKC	3
Whangarei 870	438.7000	Q07 317090	Mt Parahaki	28	ZL1UOH	ZL1ANI	

32 cm and 23 cm REPEATERS

(Receive offset: –20 MHz for Auckland 110 and Colonial Knob 150; -7.6 MHz for Belmont 880-user transmits LOW; +20 MHz for Mount Victoria 120-user transmits HIGH. No tone required, no time out used & vertical polarisation)

Station Name	Output Frequency	Map 260	Map Name	Branch Number	Trustee1	Trustee2	Note
Auckland 110	1291.1000	R11 676822	Sky City Tower	86	ZL1UDD	ZL1BFB	5
Belmont 880	928.8000	R27 670014	Belmont	74	ZL2TRV	ZL2TAR	
Colonial Knob 150	1291.5000	R27 614043	Colonial Knob	74	ZL2TAR	ZL2TFZ	5
Mount Victoria 120	1271.2000	R27 605886	Mt Victoria	74	ZL3TCE	ZL2TAR	

AX.25 REPEATERS

(Single frequency store and forward AX.25)

Station Name	Output Frequency	Map 260	Map Name	Branch Number	Trustee 1	Trustee 2	Station Call-sign	Sys Ops	Note
Bay of Plenty AX.25 ZL1TP-1	144.6250	U14 856839	Cambridge Road (Reservoir)	39	ZL1BJP	ZL1AFC	ZL1TP-1	ZL1KRH	
Blenheim AX.25 ZL2KS-1 (BHE)	144.6500	P28 026586	Jamie's Knob	22	ZL2TZE	—	ZL2KS-1		
Christchurch AX.25 ZL3CHC-1	144.6500	M36 801322	Marleys Hill	05	ZL3ADF	—	ZL3CHC-1		
Climie AX.25 ZL2VH-1 (CLIMIE)	144.6500	R27 898041	Mt Climie	63	ZL2TNG	ZL2DX	ZL2VH-1		
Dunedin AX.25 ZL4AA-1 (DUD)	144.6500	I44 231778	Karetai Road, Highcliff	30	ZL4TJH	ZL4TGR	ZL4AA-1		
Gisborne AX.25 ZL2AA-1 (GBD)	144.6500	X18 095514	Whakapunake	11	ZL2IMM	ZL2QK	ZL2AA-1	ZL2IMM & ZL2AJQ	
Gore AX.25 ZL4AL-1 (GOR)	144.6500	F45 015479	Pukerau Hill	08	ZL4AO	ZL4TCD	ZL4AL-1	ZL4AO	
Greymouth AX.25 ZL3GRY-1 (GRY)	144.6500	K31 733651	Sewell Peak	49	ZL3TY	ZL3RI	ZL3GRY-1		
Hawkes Bay AX.25 ZL2BQK-1 (NPE)	144.6500	V22 415495	Kahuranaki	13,25	ZL2IA	ZL2BDQ	ZL2BQK-1		
Kaikoura AX.25 ZL3KAI-1 (KAI)	144.6500	O31 676646	Kaikoura Peninsula	76	ZL3PZ	ZL3DR	ZL3KAI	ZL3PZ & ZL3DR	
Murchison AX.25 ZL2MUR-1 (MUR)	144.6500	M29 682416	Mt Murchison	49	ZL3TY	—	ZL2MUR-1		
Nelson AX.25 ZL2ARG-1 (NSN)	144.6500	N26 173092	Takaka Hill	26	ZL2BCA	—	ZL2ARG-1		
Queenstown AX.25 ZL4NQ-1 (ZQN)	144.6500	F41 790626	Double Cone	75	ZL4JW	ZL4NQ	ZL4JW		3
Rangitoto AX.25 ZL1IS-1 (OTO)	144.6500	S16 214123	Rangitoto Range	81	ZL1UAB	ZL1AMW	ZL1IS-1		
Rodney Digi-link 265	432.6500	R09 558397	Conical Hill Road Dome Valley	71	ZL1MO	ZL1BKD			3
Rodney Digi-link 4675	144.6750	R09 558397	Conical Hill Road Dome Valley	71	ZL1MO	ZL1BKD			3
Tararua AX.25 ZL2IB-1 (PMR)	144.6500	T23 528015	Wharite	06	ZL2VL	ZL1AFZ	ZL2IB-1		
Taumarunui AX.25 (TMN)	144.6500	S18 015553	Kururau	38	ZL1AO	ZL1UTH			
Taupo AX.25 ZL1BCO-1 (TPO)	144.6500	U17 736942	Mt Maroanui	60	ZL1BVO	ZL2JE	ZL1BCO-1		
Timaru AX.25 ZL3UR-1 (MSD)	144.6500	J40 452147	Mt Studholme	34	ZL3TGR	—	ZL3UR-1		
Westport ZL3BRC-1	146.6500	L29 140441	Mt Frederick	62	ZL3VC	ZL3TKC	ZL3BRC-1		3

BULLETIN BOARD REPEATERS

(Packet Radio BBS stations)

Station Name	Output Frequency	Map 260	Map Name	Branch Number	Trustee 1	Trustee 2	Station Call-sign	Sys Ops	Note
Gisborne 465 BBS ZL2AA	144.6500		Branch 11 Clubrooms Gisborne	11	ZL2IMM	ZL2QK	ZL2AA	ZL2IMM & ZL2AJQ	
Hamilton 340 BBS ZL1UX	433.4000	S14 102774	Hamilton Amateur Radio	12	ZL1PK	ZL4FS	ZL1UX		
Hamilton 400 BBS ZL1UX	434.0000	S14 102774	Hamilton Amateur Radio	12	ZL1PK	ZL4FS	ZL1UX		
Hamilton 465 BBS ZL1UX	144.6500	S14 102774	Hamilton Amateur Radio	12	ZL1PK	ZL4FS	ZL1UX		
Hamilton 480 BBS ZL1UX	144.8000	S14 102774	Hamilton Amateur Radio	12	ZL1PK	ZL4FS	ZL1UX		
Hamilton 750 BBS ZL1UX	147.5000	S14 102774	Hamilton Amateur Radio	12	ZL1PK	ZL4FS	ZL1UX		
Hamilton 830 BBS ZL1UX	438.3000	S14 102774	Hamilton Amateur Radio	12	ZL1PK	ZL4FS	ZL1UX		5
Nelson 750 BBS 7500 ZL2SUN 11	147.5000	O27 366886	Fringed Hill	26	ZL2BCA	—	ZL2SUN 11	ZL3TPV & ZL2UL	
Nelson BBS 4650 ZL2SUN 11	144.6500	O27 366886	Fringed Hill	26	ZL2BCA	—	ZL2SUN 11		
North Shore 265 BBS ZL1AB 1200	432.6500	R10 659934	Mairangi Bay	29	ZL1BNY	ZL1AUW	ZL1AB	ZL1AOX, ZL1BAV, ZL1BIV, ZL1BNE, ZL1HV, ZL1JJ, ZL1UFO	
North Shore 460 BBS ZL1AB 1200	144.6000	R10 659934	Mairangi Bay	29	ZL1BNY	ZL1AUW	ZL1AB	ZL1AOX, ZL1BAV, ZL1BIV, ZL1BNE ZL1HV, ZL1JJ, ZL1UFO	
North Shore 830 BBS ZL1AB 9600	438.3000	R10 659934	Mairangi Bay	29	ZL1BNY	ZL1AUW	ZL1AB	ZL1AOX, ZL1BAV, ZL1BIV, ZL1BNE, ZL1HV, ZL1JJ, ZL1UFO	

DATA REPEATERS

(Standard FM repeaters primarily used for digital modes)

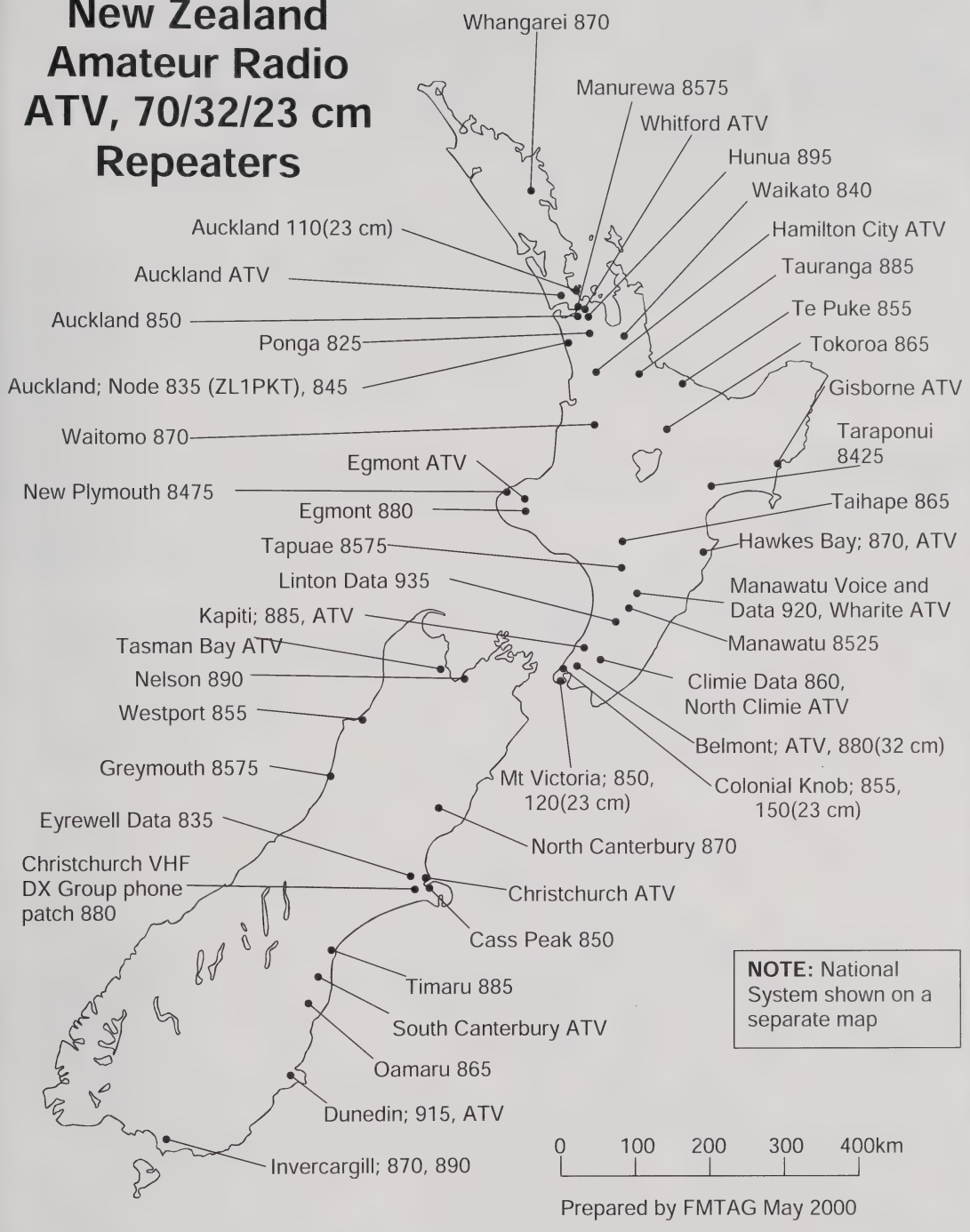
Station Name	Output Frequency	Map 260	Map Name	Branch Number	Trustee 1	Trustee 2	Station Call-sign	Note
Auckland Node 5625	145.6250	R13 705258	Port Waikato	66	ZL1TTH	ZL1DDL		
Auckland Node 835	438.3500	R13 705258	Port Waikato	66	ZL1TTH	ZL1DDL	ZL1PKT	
Canterbury Data 5625	145.6250	M36 793309	Cass Peak	56	ZL2UCX	ZL3ADL		5
Climie Data 5425	145.4250	R27 898041	Mt Climie	63	ZL2TNG	ZL2DX		
Climie Data 860	438.6000	R27 898041	Mt Climie	63	ZL2TNG	ZL2DX		
Colonial Knob Voice & Data 7075	147.0750	R27 614043	Colonial Knob	74	ZL2BC	ZL2TFZ		1
Eyrewell Data 7125	147.1250	M35 552533	Fire Lookout Tower	CARDS	ZL3MJS	ZL3TCK		3, 5
Eyrewell Data 835	438.3500	M35 552533	Fire Lookout Tower	CARDS	ZL3MJS	ZL3TCK	ZL3CAR	3
Hawkins Hill Data 6625	146.6250	R27 550853	Hawkins Hill	74	ZL3TCE	ZL2BC		
Kaimai Data 540	145.4000	T15 684649	Takaurunga	81	ZL1UAB	ZL1TAT		1
Kapiti Voice & Data 535	145.3500	R26 875374	Mt Field	69	ZL2GO	ZL2TUV		1
Linton Data 935	439.3500	S24 294776	Scotts Road	70	ZL2TCA	ZL2TAI		
Manawatu Data 5725	145.7250	T24 418852	Pahiatua Track	20	ZL2AUB	ZL2FX		
Manawatu Voice &	Data 920	439.2000	T23 528015	Wharite	20	ZL2VL	ZL1AFZ	1
Paikauri Data 6775	146.7750	O04 674923	Paikauri	78	ZL1AUI	ZL1OT		1, 3
Timaru Data 6625	146.6250	J37 559434	Mt Horrible	34	ZL3TGR	—		
Whangarei Data 665	146.6500	Q06 266150	Parakiore	28	ZL1UOH	ZL1ANI		

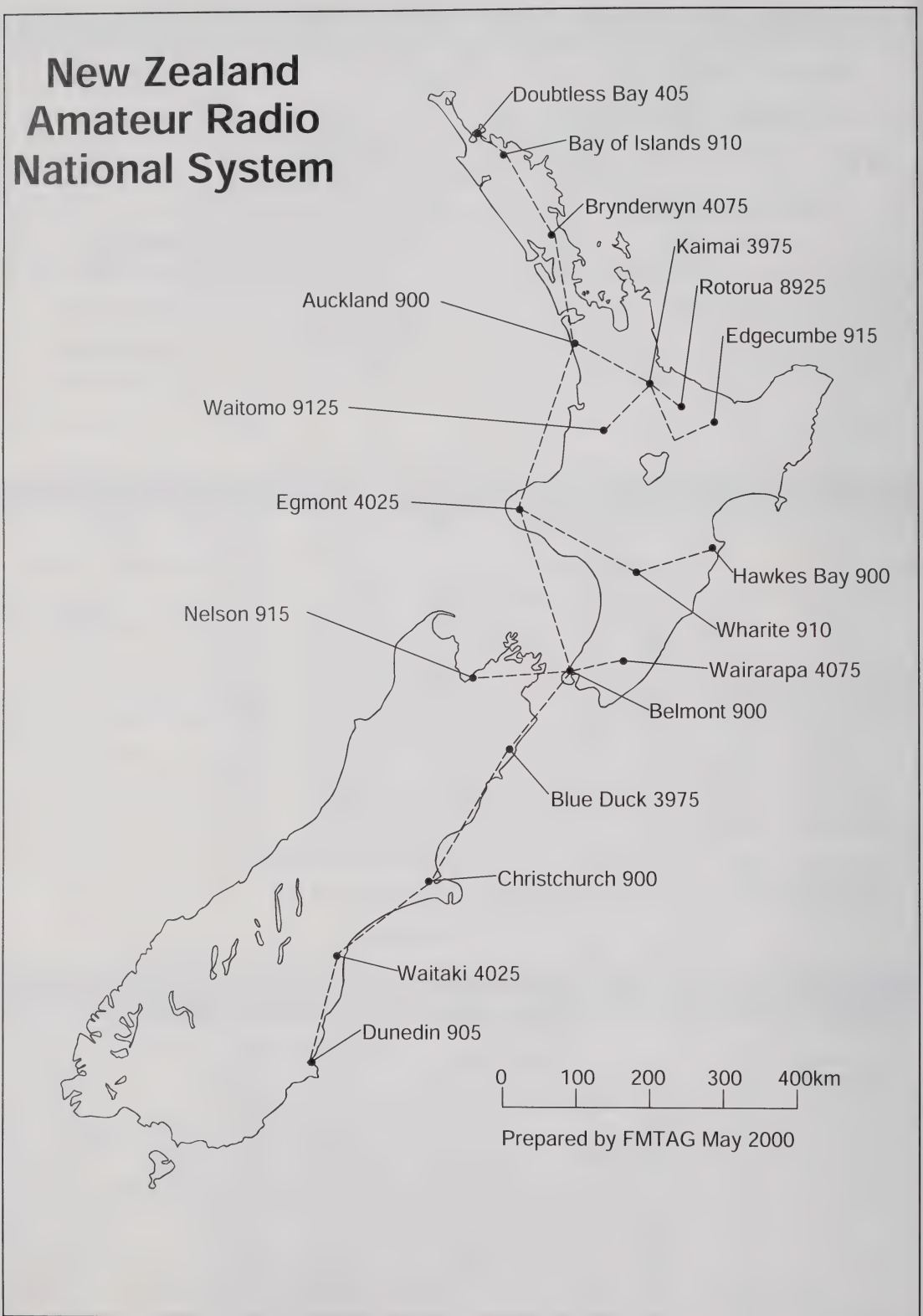
AMATEUR TELEVISION REPEATERS

(ATV repeater input 443.250 MHz vision & 448.750 MHz sound)

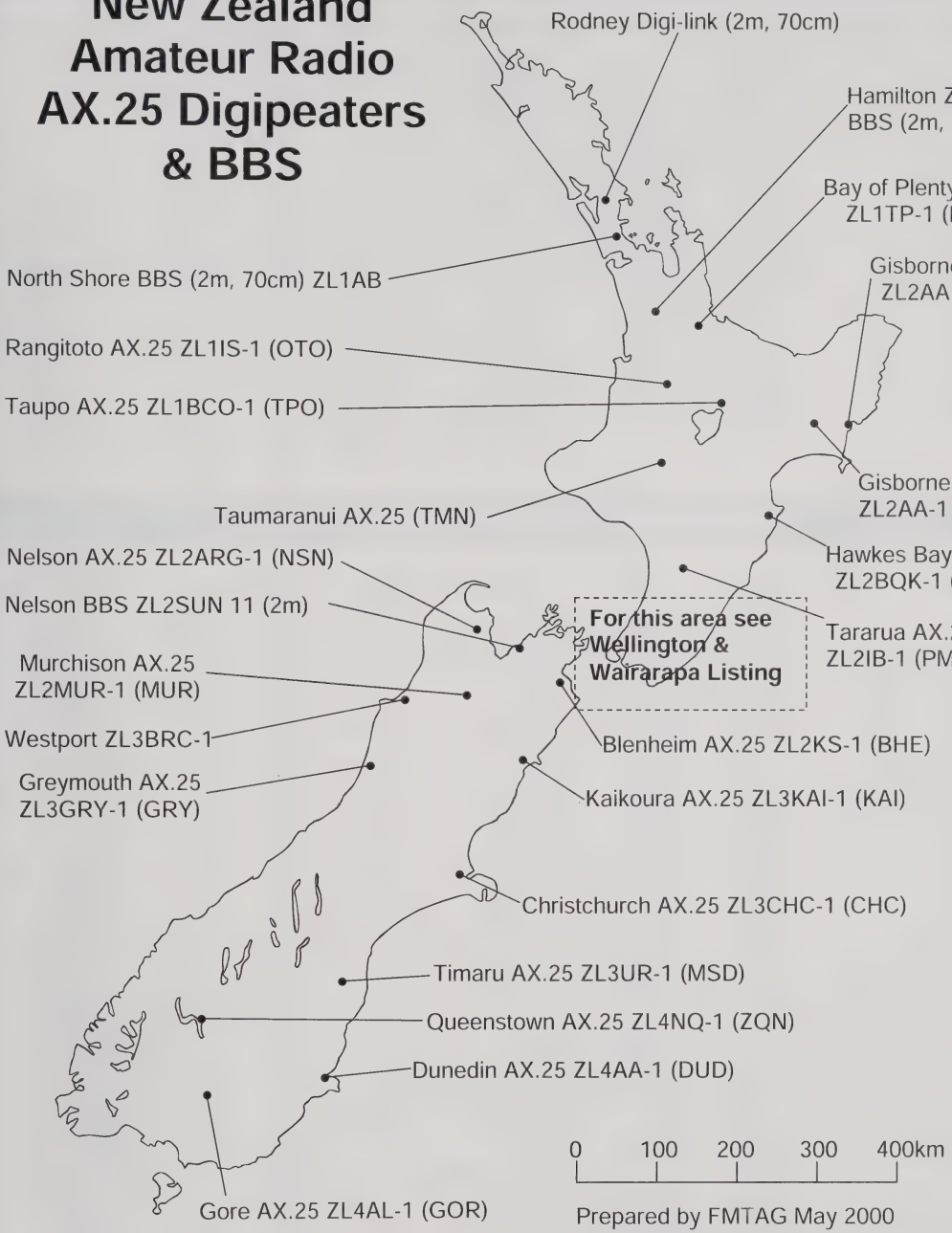
Station Name	Output Frequency	Map 260	Map Name	Branch Number	Trustee 1	Trustee 2	Station Call-sign	Note
Auckland ATV	615.2500	R11 506734	Nihotupu	66	ZL1QF	ZL1UWQ		
Belmont ATV	615.2500	R27 670014	Belmont	74	ZL2TAR	ZL2ARW		
Christchurch ATV	615.2500	M36 891242	Cashmere Hill	05	ZL3ADF	—		
Dunedin ATV	615.2500	I44 199854	Mt Cargill	30	ZL4TJH	ZL4TGR		5
Egmont ATV	615.2240	P20 036122	Mt Egmont	74	ZL2TAR	ZL2ARW		5
Gisborne ATV	615.2500	Y18 477679	Kaiti Hill, Gisborne	11	ZL2IMM	ZL2QK		
Hamilton City ATV	615.2760	S14 102774	Hamilton Amateur Radio	12	ZL1RN	ZL1UPJ		
Hawkes Bay ATV	615.2500	V22 446602	Te Mata Peak	13, 25	ZL2IA	ZL2BDQ		
Kapiti ATV	615.2500	S25 949492	Pukehou	74	ZL2TUV	ZL2TAR		5
North Climie ATV	443.2500	S27 901048	North Climie	74	ZL2ARW	ZL2TAR		5
South Canterbury ATV	615.2240	J40 452147	Mt Studholme	34	ZL3TGR	—		5
Tasman Bay ATV	615.2500	N26 983203	Takaka Hill	24	ZL2ASF	ZL2VBO		5
Wharite ATV	615.2500	T23 528015	Wharite	20	ZL2VL	ZL2AUB	ZL2KO	5
Whitford ATV	1248.0000	R11 898705	Whitford	66	ZL1QF	ZL1ABS		

New Zealand Amateur Radio ATV, 70/32/23 cm Repeaters




New Zealand
Amateur Radio
National System
Doubtless Bay 405
Bay of Islands 910
Brynderwyn 4075
Kaimai 3975
Rotorua 8925
Auckland 900
Edgecumbe 915
Waitomo 9125
Egmont 4025
Hawkes Bay 900
Nelson 915
Wharite 910
Wairarapa 4075
Belmont 900
Blue Duck 3975
Christchurch 900
Waitaki 4025
Dunedin 905
0 100 200 300 400km
Prepared by FMTAG May 2000

New Zealand Amateur Radio AX.25 Digipeaters & BBS


Rodney Digi-link (2m, 70cm)
Hamilton ZL2UX BBS (2m, 70cm)
Bay of Plenty AX.25 ZL1TP-1 (BOP)
North Shore BBS (2m, 70cm) ZL1AB
Gisborne BBS ZL2AA (2m)
Rangitoto AX.25 ZL1IS-1 (OTO)
Taupo AX.25 ZL1BCO-1 (TPO)
Gisborne AX.25 ZL2AA-1 (GBD)
Taumaranui AX.25 (TMN)
Hawkes Bay AX.25 ZL2BQK-1 (NPE)
Nelson AX.25 ZL2ARG-1 (NSN)
Nelson BBS ZL2SUN 11 (2m)
For this area see Wellington & Wairarapa Listing
Tararua AX.25 ZL2IB-1 (PMR)
Murchison AX.25 ZL2MUR-1 (MUR)
Westport ZL3BRC-1
Blenheim AX.25 ZL2KS-1 (BHE)
Greymouth AX.25 ZL3GRY-1 (GRY)
Kaikoura AX.25 ZL3KAI-1 (KAI)
Christchurch AX.25 ZL3CHC-1 (CHC)
Timaru AX.25 ZL3UR-1 (MSD)
Queenstown AX.25 ZL4NQ-1 (ZQN)
Dunedin AX.25 ZL4AA-1 (DUD)
Gore AX.25 ZL4AL-1 (GOR)
0 100 200 300 400km
Prepared by FMTAG May 2000

NATIONAL SYSTEM REPEATERS

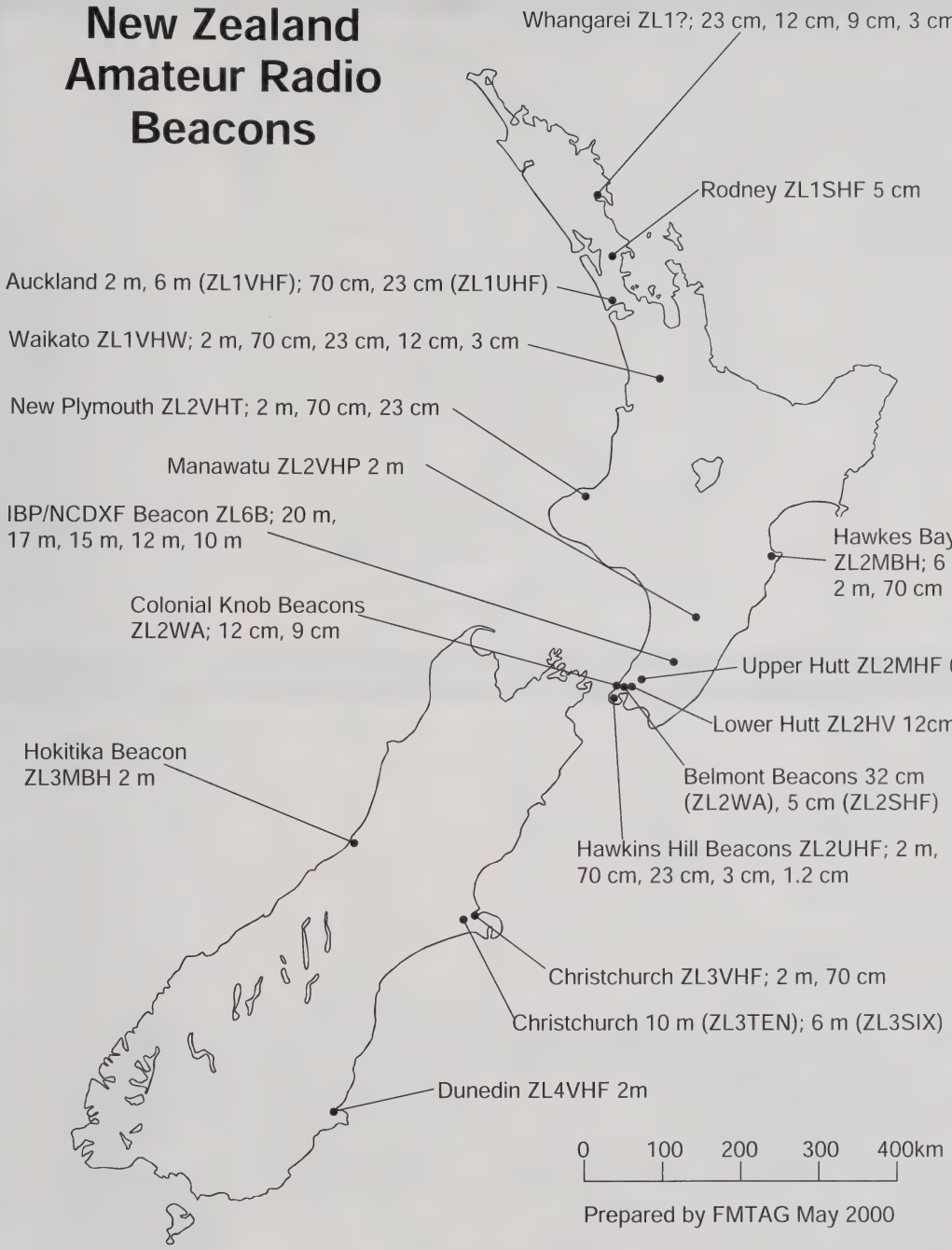
(Receive offset: –5 MHz for O/P Freq greater than 438.xxx MHz-user transmits LOW. For O/P Freq less than 435.xxx MHz-user transmits HIGH. No tone required, no time out used & vertical polarisation)

Station Name	Output Frequency	Map 260	Map Name	Branch Number	Trustee 1	Trustee 2	Station Call-sign	Note
Auckland 900	439.0000	R13 705258	Port Waikato	66	ZL1TTH	ZL1DDL		
Bay of Islands 910	439.1000	P05 844655	Manginangina	84	ZL2BER	ZL1AVW		
Belmont 900	439.0000	R27 670014	Belmont	74	ZL2ARW	ZL2TFZ		
Blue Duck 3975	433.9750	P31 753892	Blue Duck	74	ZL2BAC	ZL2ARW		
Brynderwyn 4075	434.0750	Q08 383694	Pilbrow Hill	66	ZL1UOH	—		
Christchurch 900	439.0000	M36 801322	Marleys Hill	05, 74	ZL3ADF	ZL2ARW		
Doubtless Bay 405	434.0500	O03 465034	Whatuwhiwhi	78	ZL1BG	ZL1UVR		
Dunedin 905	439.0500	I44 199854	Mt Cargill	30	ZL4TJH	ZL4TGR		
Edgecumbe 915	439.1500	V16 378374	Mt Edgecumbe	67	ZL1AIS	ZL1BGE		5
Egmont 4025	434.0250	P20 036122	Mt Egmont	74	ZL2TFZ	ZL2ARW		
Hawkes Bay 900	439.0000	V22 446602	Te Mata Peak	25, 13	ZL3DK	ZL2IA		
Kaimai 3975	433.9750	T15 684649	Takaurunga	81	ZL3GR	ZL1UAB		
Nelson 915	439.1500	O27 366886	Fringed Hill	26	ZL2BCA	—		
Rotorua 8925	438.9250	U16 080399	Whakapoungakau Trig	33	ZL1PJ	ZL1BTB		3
Wairarapa 4075	434.0750	T27 389077	Pariwhariki	74, 46	ZL2TFZ	ZL2UCW		
Waitaki 4025	434.0250	J40 452147	Mt Studholme	34 ,64	ZL3TGR	—		
Waitomo 9125	439.1250	S16 214123	Rangitoto Range	55	ZL1BZ	ZL1THG		
Wharite 910	439.1000	T23 528015	Wharite	06	ZL2VL	ZL2TUV		

AMATEUR RADIO BEACONS

Station Name	Output Frequency	Map 260	Map Name	Branch Number	Trustee 1	Trustee 2	Station Call-sign	Note
Auckland 2 m	144.2400	R11 502736	Nihotupu	66	ZL1QF	ZL1UWQ	ZL1VHF	
Auckland 23 cm	1297.1500	R11 502736	Nihotupu	66	ZL1QF	ZL1UWQ	ZL1UHF	
Auckland 6 m	50.0430	R11 502736	Nihotupu	66	ZL1QF	ZL3VTV	ZL1VHF	
Auckland 70 cm	432.2400	R11 502736	Nihotupu	66	ZL1QF	ZL1UWQ	ZL1UHF	
Belmont Beacon 32 cm	925.2750	R27 670014	Belmont	74	ZL2ARW	ZL2TAR	ZL2WA	
Belmont Beacon 5 cm	5760.0500	R27 670014	Belmont	74	ZL2ARW	ZL2TFZ	ZL2SHF	
Christchurch 10 m	28.2280	M36 603353	Rolleston	CHVHF	ZL3ADT	ZL3TIC	ZL3TEN	
Christchurch 2 m	144.2850	M36 820370	Huntsbury Hill	05	ZL3ADF	—	ZL3VHF	5
Christchurch 6 m	50.0400	M36 603353	Rolleston	CHVHF	ZL3ADT	ZL3TIC	ZL3SIX	
Christchurch 70 cm	432.2850	M36 820370	Huntsbury Hill	05	ZL3ADF	—	ZL3UHF	5
Colonial Knob Beacon 12 cm	2424.2750	R27 614043	Colonial Knob	74	ZL2TAR	ZL2TFZ	ZL2WA	5
Colonial Knob Beacon 9 cm	3456.2750	R27 614043	Colonial Knob	74	ZL2TAR	ZL2TFZ	ZL2WA	5
Dunedin 2 m	145.4000	I44 200776	Highcliff Road	30	ZL4TJH	ZL4TGR	ZL4VHF	
Eyrewell Beacon 70 cm	432.2850	M35 552533	Fire Lookout Tower	CARDS	ZL3MJS	ZL3TCK	ZL3CAR	3, 5
Hawkes Bay 2 m	145.2400	V21 454812	Napier City	13, 25	ZL2IA	—	ZL2MHB	
Hawkes Bay 6 m	51.0300	V21 454812	Napier City	13, 25	ZL2IA	—	ZL2MHB	
Hawkes Bay 70 cm	433.2400	V21 454812	Napier City	13, 25	ZL2IA	ZL2BDQ	ZL2MHB	
Hawkins Hill Beacon 1.2 cm	24150.0000	R27 550853	Hawkins Hill	74	ZL3TCE	ZL2ARW	ZL2UHF	
Hawkins Hill Beacon 2 m	144.2750	R27 550853	Hawkins Hill	74	ZL2TAR	ZL2TFZ	ZL2UHF	
Hawkins Hill Beacon 23 cm	1296.2750	R27 550853	Hawkins Hill	74	ZL3TCE	ZL2ARW	ZL2UHF	
Hawkins Hill Beacon 3 cm	10250.0000	R27 550853	Hawkins Hill	74	ZL3TCE	ZL2ARW	ZL2UHF	
Hawkins Hill Beacon 70 cm	432.2750	R27 550853	Hawkins Hill	74	ZL3TCE	ZL2BC	ZL2UHF	
Hokitika Beacon 2 m	144.2860	J33 427300	Hokitika	49	ZL3TY	—	ZL3MHB	
IBP/NCDX Beacon ZL6B 10 m	28.2000	S26 281149	Gladstone Road Carterton	46	ZL2BA	ZL2BHS	ZL6B	
IBP/NCDX Beacon ZL6B 12 m	24.9300	S26 281149	Gladstone Road Carterton	46	ZL2BA	ZL2BHS	ZL6B	
IBP/NCDX Beacon ZL6B 15 m	21.1500	S26 281149	Gladstone Road Carterton	46	ZL2BA	ZL2BHS	ZL6B	
IBP/NCDX Beacon ZL6B 17 m	18.1100	S26 281149	Gladstone Road Carterton	46	ZL2BA	ZL2BHS	ZL6B	
IBP/NCDX Beacon ZL6B 20 m	14.1000	S26 281149	Gladstone Road Carterton	46	ZL2BA	ZL2BHS	ZL6B	
Lower Hutt 12 cm	2402.2750	R27 842346	Lower Hutt	18	ZL2TWS	ZL2UKV	ZL2HV	
Manawatu 2 m	144.2710		Branch 20 Clubrooms	20	ZL2FX	—	ZL2VHP	
New Plymouth 2 m	145.2250	Q19 233368	Otaraoa Road	27	ZL2BZH	—	ZL2VHT	
New Plymouth 23 cm	1297.2250	Q19 233368	Otaraoa Road	27	ZL2BZH	—	ZL2VHT	
New Plymouth 70 cm	433.2250	Q19 233368	Otaraoa Road	27	ZL2BZH	—	ZL2VHT	
Rodney 5 cm	5765.0000	R09 473275	Kaipara Hills	71	ZL1TBG	—	ZL1SHF	
Upper Hutt 6 m	52.2750	R27 898041	Mt Climie	63	ZL2TNG	ZL2DX	ZL2MHF	
Waikato 12 cm	2424.2560	R15 835684	Te Uku	81	ZL1THG	—	ZL1VHW	5
Waikato 2 m	144.2560	S14 111765	Hamilton City	81	ZL1THG	ZL1TAT	ZL1VHW	
Waikato 23 cm	1296.2560	S14 111765	Hamilton City	81	ZL1THG	ZL1TAT	ZL1VHW	
Waikato 3 cm	10368.2560	R15 835684	Te Uku	81	ZL1THG	—	ZL1VHW	5
Waikato 70 cm	432.2560	S14 111765	Hamilton City	81	ZL1THG	ZL1TAT	ZL1VHW	
Whangarei 23 cm	1296.2530	Q06 266150	Parakiore	28	ZL1WB	ZL1UOH		5
Whangarei 9 cm	3456.2540	Q06 266150	Parakiore	28	ZL1WB	ZL1UOH		5
Whangarel 12 cm	2424.2540	Q06 266150	Parakiore	28	ZL1WB	ZL1UOH		5
Whangarel 3 cm	10368.2540	Q06 266150	Parakiore	28	ZL1WB	ZL1UOH		

New Zealand Amateur Radio Beacons


Whangarei ZL1?; 23 cm, 12 cm, 9 cm, 3 cm
Rodney ZL1SHF 5 cm
Auckland 2 m, 6 m (ZL1VHF); 70 cm, 23 cm (ZL1UHF)
Waikato ZL1VHW; 2 m, 70 cm, 23 cm, 12 cm, 3 cm
New Plymouth ZL2VHT; 2 m, 70 cm, 23 cm
Manawatu ZL2VHP 2 m
IBP/NCDXF Beacon ZL6B; 20 m, 17 m, 15 m, 12 m, 10 m
Hawkes Bay ZL2MBH; 6 m, 2 m, 70 cm
Colonial Knob Beacons ZL2WA; 12 cm, 9 cm
Upper Hutt ZL2MHF 6 m
Lower Hutt ZL2HV 12cm
Hokitika Beacon ZL3MBH 2 m
Belmont Beacons 32 cm (ZL2WA), 5 cm (ZL2SHF)
Hawkins Hill Beacons ZL2UHF; 2 m, 70 cm, 23 cm, 3 cm, 1.2 cm
Christchurch ZL3VHF; 2 m, 70 cm
Christchurch 10 m (ZL3TEN); 6 m (ZL3SIX)
Dunedin ZL4VHF 2m
0 100 200 300 400km
Prepared by FMTAG May 2000

SHORT TERM SPECIAL PURPOSE (STSP) REPEATERS

(These are standard FM repeaters used for special events & emergency use)

Station Name	Output Frequency		Branch Number	Trustee 1	Trustee 2	Note
Alexandra STSP 6625	146.6250	Portable	61	ZL4THT	—	
Auckland STSP 6825	146.8250	Portable	65	ZL1BNQ	ZL1MR	
Auckland STSP 875	438.7500	Portable	65	ZL1BNQ	ZL1MR	
Christchurch STSP 7275	147.2750	Portable	05	ZL3ADF	—	5
Hamilton STSP 5325	145.3250	Portable	12	ZL1TCE	ZL1UST	
Hamilton STSP 8725	438.7250	Portable	12	ZL4FS	ZL1UST	
Hawkes Bay STSP 6925	146.9250	Portable	25, 13	ZL3DK	ZL2UIO	
Horowhenua STSP 5475	145.4750	Portable	16	ZL2IG	—	5
Kapiti STSP 8725	438.7250	Portable	69	ZL2GO	ZL2TUV	
Manawatu STSP 6825	146.8250	Portable	20	ZL2AUB	—	
Masterton STSP 6725	146.7250	Portable	46	ZL2BFY	ZL2BFU	3
Nelson STSP 6925	146.9250	Portable	26	ZL2BCA	—	
Papakura STSP 6875	146.8750	Portable	65	ZL1BNQ	ZL1MR	
Rotorua STSP 6675	146.6750	Portable	33	ZL1PJ	ZL1BTB	
South Canterbury STSP 8725	438.7250	Portable	34	ZL3TGR	ZL3JS	
Tararua STSP 6825	146.8250	Portable	06	ZL1AFZ	ZL2VL	
Taumarunui STSP 6725	146.7250	Portable	38	ZL1AO	ZL1UTH	
Upper Hutt STSP 6675	146.6750	Portable	63	ZL2TNG	ZL2DX	
Wellington STSP 6875	146.8750	Portable	74	ZL2TFZ	ZL2ARW	
Wellington STSP 8675	438.6750	Portable	74	ZL2TFZ	ZL2ARW	
Wellington STSP 8775	438.7750	S25 036626 Levin	74	ZL2TUV	ZL2TAR	
Whakatane STSP 6825	146.8250	Portable	51	ZL1TKL	ZL1BGE	

CARDS=Canterbury Amateur Radio Development Society

NOTE:

1=Voice/data repeater shared under local arrangement;
2=Linked repeater (with optional brief linking detail);
3=Solar/Wind power;
4=Linear repeater ±15 kHz;
5=Not operational at *Call Book* update time.

SIMPLEX AND CALLING FREQUENCIES

144.100 Oceania SSB Calling
144.200 NZ SSB Calling
144.500 FM Calling
144.575 Data Simplex
144.600 Primary Data/Packet Store/Forward. Linked National System
144.625 Secondary Data/Packet Store/Forward Linked National System
144.650 Primary Local Data/Packet Store/Forward
144.675 Secondary Local Data/Packet Store/Forward
145.250 FAX
146.425 to 146.600FM SIMPLEX
146.475 FM Calling
147.400 to 147.600 FM Simplex
147.500 Tertiary Local Data/Packet Store/Forward

432.200 SSB Calling
432.500 FM Calling
432.575 Data Simplex
432.600 Primary Data/Packet Store/Forward Linked National System
432.625 Secondary Data/Packet Store/Forward Linked National System
432.650 Primary Local Data/Packet Store/Forward
432.675 Secondary Local Data/Packet Store/Forward
438.300 Tertiary Local Data/Packet Store/Forward

Above 144 MHz, use the following as a guide to designated frequencies:
F to F+1 MHz for standard narrow band or weak signal segment, where F = 144, 432, 621, 925, 1296, 2424, 3456, 5760, 10368, 24192, 47088, 80640 MHz.

F+0.20 SSB calling
F+0.25 to 0.30 Beacons (geographic plan)
F+0.50 FM calling
F+0.575 Data Simplex
F+0.60 Primary data/packet-linked to National System
F+0.625 Secondary data/packet-linked to National System
F+0.65 Primary local data/packet
F+0.675 Secondary local data/packet.

There may be additional designated frequencies in this segment in some bands.
Prepared by FMTAG May 2000

NCDXF/IARU INTERNATIONAL BEACON NETWORK

The Foundation, in cooperation with the IARU, maintains a network of beacon stations which operate sequentially on five bands. The 10 dB power steps are precise and are useful for "S" meter calibration and for judging band conditions. The entire system was designed and built by Foundation volunteers at no cost except for the actual price of hardware components.

The actual starting time of each transmission is approximately twenty milliseconds after the nominal time due to the keying delay of the transmitter. Equipment used at each beacon site includes a Kenwood TS-50S transmitter, a Cushcraft R-5 vertical antenna, a Trimble Navigation Acutime™ GPS receiver, and a controller built by the NCDXF. For more information, see The NCDXF/IARU International Beacon Network by John G. Troster and Robert S. Fabry, *QST*, October 1994 pp 31–33 and November 1994 pp 49–51, or contact the Northern California DX Foundation, Post Office Box 2368, Stanford, CA 94309-2368, USA.

For the latest information see the NCFDX web site at: http://www.ncdxf.org/beacon.htm

Prepared by FMTAG May 2000

Table 1. NCDXF/IARU Beacon Transmission Schedule

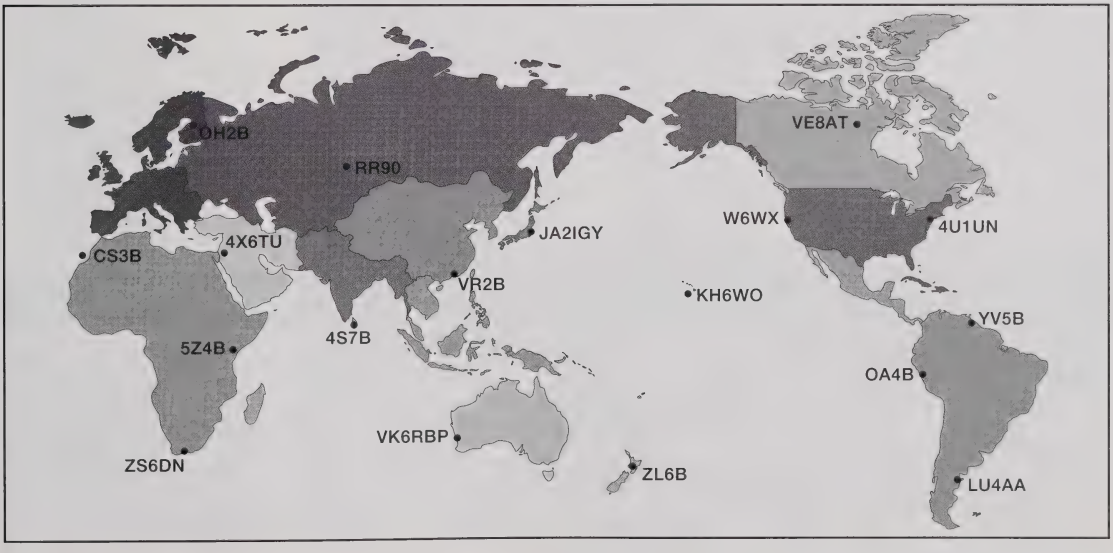
As at 1 April 2000

This table gives the minute and second within each hour of the start of the first transmission of each of beacon on each frequency. Each transmission is repeated every three minutes. A transmission consists of the callsign of the beacon sent at 22 words per minute followed by four one-second dashes. The callsign and the first dash are sent at 100 watts. The remaining dashes are sent at 10 watts, 1 watt and 0.1 watts.

Slot	Country	Call	14.100	18.110	21.150	24.930	28.200	Operator	Status
1	United Nations	4U1UN	00:00	00:10	00:20	00:30	00:40	UNRC	OK
2	Canada	VE8AT	00:10	00:20	00:30	00:40	00:50	RAC	OK
3	United States	W6WX	00:20	00:30	00:40	00:50	01:00	NCDXF	No output on 18 or 24 MHz
4	Hawaii	KH6WO	00:30	00:40	00:50	01:00	01:10	NOARG, HARC	Sometimes garbled
5	New Zealand	ZL6B	00:40	00:50	01:00	01:10	01:20	NZART	OK
6	Australia	VK6RBP	00:50	01:00	01:10	01:20	01:30	WIA	OK
7	Japan	JA2IGY	01:00	01:10	01:20	01:30	01:40	JARL	Sometimes garbled
8	Russia	RR9O	01:10	01:20	01:30	01:40	01:50	SRR	OK
9	China	VR2B	01:20	01:30	01:40	01:50	02:00	CRSA, HARTS	Intermittent
10	Sri Lanka	4S7B	01:30	01:40	01:50	02:00	02:10	RSSL	OK
11	South Africa	ZS6DN	01:40	01:50	02:00	02:10	02:20	ZS6DN	OK
12	Kenya	5Z4B	01:50	02:00	02:10	02:20	02:30	RSK	OK
13	Israel	4X6TU	02:00	02:10	02:20	02:30	02:40	U Tel Aviv	Intermittent
14	Finland	OH2B	02:10	02:20	02:30	02:40	02:50	U Helsinki	OK
15	Madeira	CS3B	02:20	02:30	02:40	02:50	00:00	ARRM	Sometimes garbled
16	Argentina	LU4AA	02:30	02:40	02:50	00:00	00:10	RCA	OK
17	Peru	OA4B	02:40	02:50	00:00	00:10	00:20	RCP	Weak on 21 MHz
18	Venezuela	YV5B	02:50	00:00	00:10	00:20	00:30	RCV	OK

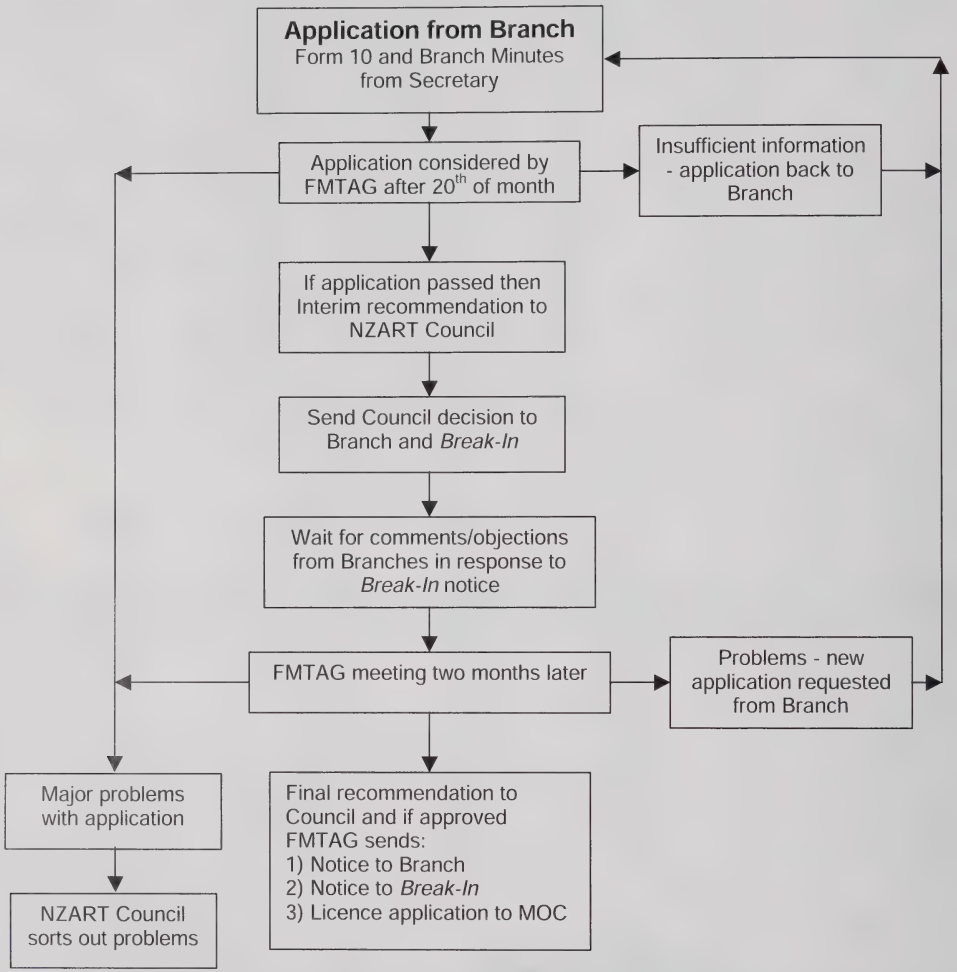
Table 2. NCDXF/IARU Beacon Locations

Slot	Country	Call	Location	Latitude	Longitude
1	United Nations	4U1UN	New York City	40° 45' N	73° 58' W
2	Canada	VE8AT	Eureka, Nunavut	79° 59' N	85° 57' W
3	United States	W6WX	Mt. Umunhum	37° 09' N	121° 54' W
4	Hawaii	KH6WO	Laise	21° 38' N	157° 55' W
5	New Zealand	ZL6B	Masterson	41° 03' S	175° 36' E
6	Australia	VK6RBP	Rolystone	32° 06' S	116° 03' E
7	Japan	JA2IGY	Mt. Asama	34° 29' N	136° 47' E
8	Russia	RR90	Novosibirsk	54° 59' N	82° 54' E
9	China	VR2B	Hong Kong	22° 16' N	114° 11' E
10	Sri Lanka	4S7B	Colombo	6° 54' N	79° 52' E
11	South Africa	ZS6DN	Pretoria	25° 54' S	28° 16' E
12	Kenya	5Z4B	Kilifi	3° 37' S	39° 50' E
13	Israel	4X6TU	Tel Aviv	32° 06' N	34° 48' E
14	Finland	OH2B	Espoo	60° 11' N	24° 50' E
15	Madeira	CS3B	Santo da Serra	32° 43' N	16° 48' W
16	Argentina	LU4AA	Buenos Aires	34° 37' S	58° 21' W
17	Peru	OA4B	Lima (temporary)	12° 04' S	76° 57' W
18	Venezuela	YV5B	Caracas	10° 25' N	66° 51' W



FMTAG PROCEDURE—MAY 1999

FMTAG Procedure - May 2000


Application from Branch
Form 10 and Branch Minutes from Secretary
Application considered by FMTAG after 20th of month
Insufficient information - application back to Branch
If application passed then Interim recommendation to NZART Council
Send Council decision to Branch and *Break-In*
Wait for comments/objections from Branches in response to *Break-In* notice
FMTAG meeting two months later
Problems - new application requested from Branch
Major problems with application
NZART Council sorts out problems
Final recommendation to Council and if approved FMTAG sends:
1) Notice to Branch
2) Notice to *Break-In*
3) Licence application to MOC

FREQUENCY MANAGEMENT TECHNICAL ADVISORY GROUP (FMTAG)

FMTAG consists of:

Chairperson, Secretary and others as appointed by NZART Council

The purpose and actions of the FMTAG are:

- Study and report to Council on matters affecting amateur radio frequencies.
- Plan future use of amateur bands
- Select frequencies for Amateur Fixed Stations
- Maintain a register of Amateur Fixed Stations
- Assists in preparing drafts for Council including submissions when needed, to the Ministry of Economic Development (Radio Spectrum Division) on behalf of the Amateur Service prior to each major ITU meeting or conference
- Bandplans are developed by the FMTAG based on IARU recommendations, local requirements, and submitted to NZART Council for approval

Application Forms for repeaters and beacons can be obtained from a NZART Councillor, NZART HQ or email your request to fmtag@nzart.org.nz.

Prepared by FMTAG MAY 2000

TIME AND FREQUENCY

by
A. C. CORNEY
ZL2BBJ

Review of Timekeeping in New Zealand

Timekeeping began in New Zealand in 1862, when Captain Stephen Carkeek, Controller of Customs, recommended to the Superintendent of Wellington Province that a transit instrument, an astronomical clock, and a time ball be placed in the new Custom House which was to be erected on what eventually became the site of the General Post Office.

A transit instrument allows mean local time to be calculated. This is the time appropriate to the longitude of the point of measurement, relative to the Greenwich Meridian, allowing four minutes per degree of longitude, or one hour per 15 degrees. It was not until 1868 that the General Government proclaimed a uniform time for New Zealand based on the meridian 172° 30' East. The advent of the telegraph had made rapid communications possible and therefore the concept of a uniform time feasible without the need for observations in every town and port. New Zealand was in fact the first country to establish a uniform time by legislation, and its scientists played an important role in establishing uniform time zones in certain other countries.

A new Colonial observatory was built in Wellington in 1869 in the Bolton Street Cemetery, on the site where the Richard John Seddon memorial now stands. Seddon's death in 1906, and the choice of the site for the memorial, precipitated the move of the Observatory to its present site in the Botanical Gardens in Kelburn. A small red brick building was erected on the site of the old Gardens Battery. It was completed in 1907 and became known as the Hector Observatory, after Sir James Hector, who had been Director of the Colonial Observatory.

Experiments with radio time signals began in 1916, with the reception of signals from Melbourne and transmission to ships in the vicinity of New Zealand and to Tahiti. Other regular services were established in 1919.

In 1926 the Department of Scientific and Industrial Research was formed, and became responsible for the Time Service. Although precision in time signals of a quarter of a second was claimed until the 1950s, the actual errors were often greater than this. The Geophysics Division of the DSIR was formed in 1951, and took over administrative responsibility for the Time Service. It was not until 1962, however, that any real advances were made. Clocks which used the very stable electrical oscillations of quartz crystals were installed. Checks were made regularly against radio time signals from overseas which were obtained from astronomical observations, and appropriate corrections were made for the propagation time to Wellington.

In 1987 responsibility for the Time Service passed to the Physics and Engineering Laboratory, DSIR, and was relocated from Kelburn in Wellington to Gracefield, Lower Hutt. In 1992 when the DSIR was disestablished and its responsibilities taken over by Crown Research Institutes, the Time Service remained at Gracefield but became the responsibility of the Measurement Standards Laboratory of New Zealand (MSL), part of Industrial Research Limited.

UTC and UT1

Since 1967 the world's time has been related to an even more stable clock than our rotating earth—the vibrations of the caesium atom. Each element has its characteristic frequency of vibration, such as that of sodium which gives us the familiar orange colour of highway lighting. Although the characteristic frequency of caesium is particularly stable, a caesium clock on its own does not constitute a time standard. Rather, information from caesium clocks maintained by standards laboratories around the world is collated by the Bureau Innternational des Poids et Mesures (BIPM) in Paris to provide Co-ordinated Universal Time (UTC). As with the old Greenwich Mean Time, UTC is the time at zero degrees longitude.

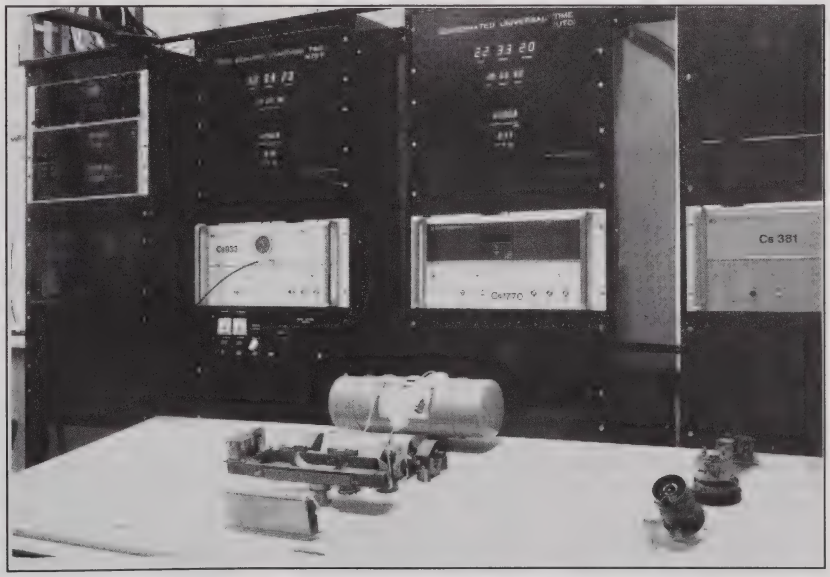
Because the rate of rotation of the earth is not constant, differences between mean solar time (UT1) and the atomic time (URC) accrue which in time could become inconvenient. It is therefore necessary to make periodic adjustments to the atomic scale so that it roughly approximates UT1. At the beginning of 1972 the cumbersome "variable length second" used to adjust atomic time was replaced by the "leap second concept". UTC was set up to be slightly fast, so that a "leap second" could be added on the first day of January or July when necessary, but would not be expected to average more than one a year. An adjustment was made on July 1, 1997 of one second so that the atomic time scale has now been incremented by 31 seconds since 1972. The atomic time scale is thus at all times within ±0.7 seconds of mean solar time. The difference between UT1 and UTC, known as DUT1, is encoded and broadcast by time and frequency stations.

The New Zealand Time and Frequency Standard

The New Zealand time standard is maintained by means of three caesium clocks. Linkage to the BIPM is via the Global Positioning Satellite system which give accuracies of better than 100 nanoseconds. The satellite system is also utilized to transfer the MSL atomic time to the BIPM to be included in the ensemble of clocks used to calculate the international atomic time scale.

The time standard is also New Zealand's frequency standard, accurate to parts in 10^{13}. Standard frequency dissemination to New Zealand users is via the TV1 and TV2 television transmissions. The colour burst frequencies of these transmissions are controlled by rubidium oscillators which are monitored against the MSL caesium clocks, and are usually within 10^{11} of the nominal colour burst frequency of 4.43361875 MHz. The highest accuracies, approaching one part in 10^{12}, are obtained by comparing the timing of selected synchronization pulses with results obtained at MSL.

The most widely used time signals in New Zealand are those generated by MSL, for broadcast by Radio New Zealand. Some private radio stations also broadcast the time signals. These signals are transmitted every hour and consist of six "pips" of 1000 Hz tone, at one second intervals, the beginning of each pip marking the exact second. When a pip marks the exact hour, its length is doubled. The precision with which the beginning of the long pip marks the exact hour is usually less than 10 μS as it leaves MSL. Delays along telephone lines to Radio New Zealand and in radio propagation to the remote parts of New Zealand can



The New Zealand Caesium Clock installation.

amount to a few milliseconds. When it is necessary to insert a leap second, seven pips are broadcast.

Talking Clock

MSL operates a talking clock which is made available to the New Zealand public via the Telecom NZ 0900 service for a standard charge, currently 80 cents per call from anywhere in New Zealand. On dialling 0900 45-678 to access the talking clock, the user receives a voice announcement of the time followed by three "pips" of 1000 Hz tone. The start of the third pip is the exact time. The announcement and pips are repeated at 10 second intervals to give six time announcements in all, ensuring that the full minute is always included. The accuracy of the talking clock is limited by the propagation delays of the telephone network which would not normally exceed 30 mS for the remotest parts of New Zealand.

MSL has recently developed a dial-up time service for computers. On dialling the service (0900-45-222) using a 1200 baud modem, a series of time strings is transmitted which contain the current time and date for both New Zealand time and UTC time, and an on-time marker. Warning is provided of forthcoming leap seconds and daylight saving changes. The accuracy of the system is limited by propagation delays in the telephone network and scrambler delays in the modems to around 100 mS. Software for IBM-compatible PCs to access the system automatically is available at no cost from MSL.

WWV and WWVH

The National Institute of Standards and Technology (NIST) broadcasts standard time and frequency transmissions continuously through stations WWV and WWVH.Station WWV is located at Fort Collins, Colorado and broadcasts continuously on the radio frequencies of 2.5, 5, 10, 15 and 20 MHz. Station WWVH is located at Kauai, Hawaii and broadcasts continuously on the radio frequencies of 2.5, 5, 10 and 15 MHz.

Both stations are controlled by caesium atomic oscillators. The frequencies are stable to better than one part in 10^{11} at all times, compared with the primary atomic standards maintained at the NIST Boulder laboratories. Changes in the propagation medium cause frequency changes which are several orders greater than the uncertainties described above.

Seconds pulses are transmitted continuously, even during tones and announcements, and are derived from the same oscillator which generates the carrier frequency. Seconds pulses comprise five cycles of 1000 Hz tone for WWV and six cycles of 1200 Hz tone for WWVH. Each minute, except the first of the hour, begins with an 800 mS tone of 1000 Hz at WWV and 1200 Hz at WWVH. Each pulse is preceded by 10 mS of silence and followed by 25 mS of silence. The first minute of the hour begins with an 800 mS tone of 1500 Hz from both stations.

At WWVH, time announcements are made by a female voice in the period 45 seconds to 52.5 seconds after each minute, while at WWV a male voice announces the time in the last 7.5 seconds of each minute. All time announcements are referred to in terms of UTC as maintained by the NIST. The 0 to 24 hours system is used. The first two figures give the hour and the last two figures give the minutes past the hour when the tone returns. The time announcement refers to the end of an announcement interval, ie, to the time when the 0.8 second long audio tone begins. At 1035 UTC for instance, the voice announcement, given in English, is: "At the tone, ten hours thirty-five minutes Co-ordinated Universal Time".

Standard audio frequencies of 440 Hz, 500 Hz and 600 Hz are broadcast by the two stations. The duration of each transmitted tone is approximately 45 seconds. A 600 Hz tone is broadcast by WWV during odd minutes and during even minutes by WWVH. A 500 Hz tone is broadcast during alternate periods unless voice announcements or silent periods are scheduled. The 440 Hz tone is broadcast beginning one minute after the hour at WWVH and two minutes after the hour at WWV. The 440 Hz tone is omitted during the first hour of the UTC day to act as a day marker. No audio tones or special announcements are broadcast during a semi-silent period from either station. The periods are from 45 to 50 minutes after the hour from WWV and from 15 minutes to 20 minutes after the hour at WWVH.

The method of coding the corrections (DUT1) to UTC to obtain UT1 uses a system of double second pulses. The first through eighth second pulse, when marked by a double pulse, will indicate a "plus" correction, and from the ninth through the fifteenth a "minus" correction. The amount of correction is determined by counting the number of second pulses which are doubled. For example, if the first, second and third second pulses are doubled, the correction is 0.3 seconds. Or if the ninth, tenth, eleventh, twelfth, thirteenth and fourteenth second pulses are doubled, the correction is "minus" 0.6 seconds.

A modified IRIG-H time code, giving the year, day of year, hour, minute, DUT1 value, and information on impending leap seconds and daylight saving (in the USA) is broadcast continuously on a 100 Hz sub-carrier.

A broadcast of radio propagation conditions and solar activity is broadcast in voice during part of every eighteenth minute of each hour from WWV. The announcements are short term forecasts, updated as required, every six hours if needed.

VNG

The Australian time and frequency station VNG is located at Llandilo, near Penrith in Sydney, and due to its close proximity to New Zealand, offers a more reliable source of time and frequency than other shortwave stations. Transmission frequencies are 2.5, 5, 8.638, 12.984 MHz on a continuous basis, and at 16 MHz from 2200–1000 UTC. Transmitter powers are 1 kW at 2.5 MHz, 5 kW at 16 MHz, and 10 kW at the other frequencies. Station identification is given during the 15th, 30th, 45th and 60th minutes using voice on 2.5, 5, and 16 MHz, and Morse on 8.638 and 12.984 MHz. A talking clock operating on 2.5, 5 and 16 MHz gives the time in UTC each minute, immediately after the minute marker.

The VNG time code format comprises normal seconds markers of 50 mS duration 100 Hz tone, reduced to 5 mS in seconds 55–58, and omitted for the 59th second. The minute marker is 500 mS of 1000 Hz tone. During the fifth, 10th, 15th, etc minute, seconds markers 50–59 are 5 mS of 1000 Hz tone. DUT1 information is conveyed during the first 16 seconds of the minute by normal seconds markers emphasized by 50 mS of 900 Hz tone.

A time code complying with CCIR recommendations is broadcast between seconds marker 20 and seconds marker 46. It gives time of day (UTC) and day number of year in binary-coded-decimal form, with the minute coded between seconds 21–28, the hour between 28–35, and the day of year between 35–46. The code is valid for the next minute. Binary "0" is 100 mS duration, binary "1" is 200 mS duration, and parity check bits are given at 28, 35, and 46 seconds. Counting binary "ones" of each group plus the corresponding parity bit gives an even number.

For more information see "Keeping Australians in tune and on time", *Electronics Australia*, June 1993, pp. 26–29. Technical enquiries and reception reports can be directed to: Executive Director, National Standards Commission, 12 Lyonpark Road, PO Box 282, North Ryde NSW 2113, Australia.

Global Positioning System

The Global Positioning System (GPS) is a worldwide satellite-based radionavigation system developed and operated by the US Department of Defence. It comprises 21 satellites orbiting the earth in 12 hour orbits. Each satellite broadcasts information on two microwave frequencies (1575.42 and 1227.60 MHz) giving the time according to the on-board caesium clock, and the current satellite position. In a navigation receiver this information is used to determine the receiver's position anywhere on earth. The deliberate degradation of the accuracy of the time information available to civilian users ceased in May 2000. Time accuracy of the order of 10 nanoseconds and a frequency stability of better than one part in 10^{12} can be obtained.

Although some manufacturers of GPS equipment claim traceability of the time and frequency information to the US Naval Observatory, such traceability is not recognized by most measurement accreditation bodies. This is because GPS is primarily a navigation system and the provision of time and frequency information is an incidental feature. It can be wrong at times: we have noted leap seconds being introduced at the correct time for the US but taking a further six hours before receivers in New Zealand were aware of the change.

A. C. Corney
Measurement Standards Laboratory, Industrial Research Limited

SHORT WAVE LISTENING

by
BARRY WILLIAMS
ZL1ACZ

Question a gathering of hams, and one will inevitably find that several were once DXers or shortwave listeners, before they moved on to join the ranks of amateur radio. Many listeners progress no further than just being listeners, a few becoming serious DXers, but for some the novelty of talking to the world draws them into amateur radio. Those who have progressed through the hobby of DXing have acquired much of the basic radio theory, and are better prepared for the study required to sit the amateur radio exam.

The similarities between the two hobbies are numerous. The bands that DXers monitor range from VLF to VHF. The modes range from AM to FM. With the increasing use of computers, digital reception is gaining interest. However, despite the widening range of options, listening to shortwave broadcasts still remains the most popular activity.

Like amateur radio, the equipment used over the years has changed. Gone are the days when the dual band household radio served as the DX receiver. After the war, DXers use war-surplus radio sets such as the Marconi 1155, ARC5 and Bendix MN26C compass receiver. Gradually, valve communication receivers, such as the Eddystone and Hallicrafters became available and affordable. Today, like the amateur, we are in the digital age, with sophisticated receivers ranging from the small portable SONY 7600G to the professional NRD545 communications receiver. Over the years amateur equipment has developed to an even greater extent, with many hams using multi functional transceivers that incorporate all-band general coverage reception.

Unlike the amateurs, the antennas used by the DXer over the years have changed little. The fortunate few who have the space to run out a beverage still chase the elusive medium wave DX. Most, persevere with an end-fed wire or a dipole. Those DXers living in high noise suburbia try and develop low-noise antennas. Like amateur radio there is great scope for development, but we do tend to lack the technical expertise that the ham fraternity can draw upon. Because of the wide range of shortwave bands, the DXer does have great difficulty designing a multi-band antenna. However, with regard to propagation, I feel that any top DXer can "hold their own" with a ham DXer. Propagation is just as important to both hobbies. We complain about band conditions just as much as the ham down the road.

For many shortwave listeners, the QSLing of reception reports is the whole purpose of it all. But more and more, verification is becoming less important and just hearing the station and program is the enjoyment. The variety of program heard over international broadcasters is far more varied and interesting than that heard on domestic radio. Nevertheless, serious DXing is still the backbone of the hobby, and the thrill of hearing and finally verifying a rare low powered station from some exotic country, is no different than that experienced by an amateur DXer.

DXing in New Zealand is almost as old as amateur radio, with the first DX club being formed in 1931.

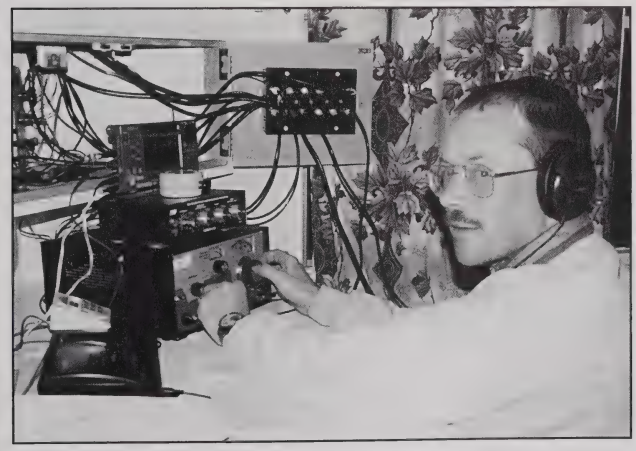
Auckland DXer Bryan Clark test drives the latest miniature communications receiver from Sony, the ICF-SW07. In the background is another innovative Sony product, the AN-LP1 active antenna.

Although the New Zealand DX Club folded in the late 1940s, two other DX clubs are still active; the New Zealand DX Radio Association now in is 67th year and the New Zealand Radio DX League, which celebrated its 50th anniversary in 1998.

Amateur radio, like all other hobbies, loses some participants to other pastimes and interests. This loss of interest in many cases may be due to boredom or burnout with the hobby. New horizons and challenges may be needed. We all get stale or frustrated at some time. May I suggest to those amateurs who feel they need a variation or change, but still retain their interest in wireless, they consider shortwave listening. Some hams who entered amateur radio through the hobby of DXing might consider revisiting it. Most hams have an antenna and a rig capable of general coverage reception. It might be worthwhile tuning a bit further than just the ham bands. Start listening to the world of International Shortwave Broadcasting. Both hobbies fit nicely together, as found in Auckland where the Western Suburbs Radio Club allows the Auckland Branch of the New Zealand Radio DX League to hold its monthly meetings in their clubrooms. In return, Branch 03 has gained several newly licensed hams from the ranks of the DXers.

Check your *Break-In* and read Mike Butler's "Shortwave Listening" section. Try listening to a few broadcasts or write for a sample of the New Zealand Radio DX League's monthly magazine, the *NZ DX TIMES*. I have found that shortwave listening and amateur radio complement each other and have helped maintain my interest in both hobbies for many years.

Barry Williams ZL1ACZ



Top New Zealand DXer Paul Ormandy has amassed an impressive list of shortwave and mediumwave catches at his "antenna farm" in North Otago. Paul uses a Drake SPR4 communications receiver and a selection of Beverage and Dipole antennas.

NEW ZEALAND COASTAL MARITIME RADIO STATIONS

VHF stations

The following table shows the scheduled broadcast times for Maritime Safety Information (MSI) transmitted by Maritime Radio VHF stations located around the New Zealand coast. Broadcasts will include Navigational and Meteorological warnings, the situation and forecast for all New Zealand sea areas, and Coastal Reports for Shipping. Transmissions will be made simultaneously on all of the working channels following a broadcast announcement call on VHF Ch 16. Vessels must then ensure they select the **appropriate working channel**, either channel **67** or **68** or **71**, based on their location at the time. All stations maintain continuous watch on Ch 16—Distress and Calling—and are remotely controlled from the Maritime Operations Centre, Wellington.

Ph: (04) **914-5663**
Fax: (04) **914-5520**

Call

Initial call should be made on Ch 16 (site name) Maritime Radio, eg: Plenty Maritime Radio (see Table 1).

Scheduled broadcast times (NZST or NZDT)

Warnings and Weather

0533, 0733, 1033, 1333, 1733, 2133.

The 1033 broadcast will only including all warnings in force and the coastal reports as at 0900 NZST or NZDT (no situation or forecasts).

Chatham Islands Fisherman's Radio

Distress and working

(No listening watch kept). Ch 60 (Chatham Island) and Ch 62 (Pitt Island).

Scheduled Broadcast times—Warnings and Weather

0603†, 1403†, 1803†, 2203†.

†Chatham Islands time is 45 minutes ahead of New Zealand local time.

MF/HF station

Taupo Maritime Radio (ZLM)

38° 52'S 176° 26'E.

Public MF/HF station for distress and safety purposes. Broadcasts of weather situation, forecasts and warnings, and navigational warning as shown in the schedule.

Note: remotely controlled from the Maritime Operations Centre, Wellington:

Ph: (04) 914-4663
Fax: (04) 914-5520

Continuous watch on

2182, 4125, 6215, 8291, 12290 16420 kHz.

Call

2182, 4125, 6215, 8291, 12290, 16420 kHz.

Working

2207, 4146, 6224, 8297, 12356, 16531 kHz.

HF radio communications forecasts and warnings

Maritime Safety Authority promulgate forecasts and warning to help mariners in selecting the most effective HF (SSB) frequency to use. HF radio communications change over time in response to changes in the Earth's ionosphere and in the amount of ultra-violet light emitted by the sun. Some of these changes happen over long cycles of many years, and some can be quite sudden and of short duration. The two types of information cater for these extremes.

HF radiocommunications forecasts

For the longer term variations, forecasts will be issued as Notices to Mariners every two or three months. See HF Night/Day Coverage Maps which provide assistance to the mariner in selecting the optimum HF frequency depending on their position and the time of day.

HF radiocommunications warnings

For short term, specific disturbances that are expected to adversely affect communications, the Maritime Safety Authority will issue HF Radio Communications Warnings. These warnings will describe the expected changes to the HF radio communications conditions, and indicate to the mariner how communications can be optimized for the period of the change. For severe disruptions, the warnings may indicate that communication is likely to be impossible at certain times and places. Armed with this warning the mariner can prepare in advance. These warnings will be broadcast on Taupo Maritime Radio ZLM as for navigational warnings.

Table 1

Station		Working
Kaitaia	Maritime Radio	Ch 71
Great Barrier Island	Maritime Radio*	Ch 67, 68, 71
Auckland	Maritime Radio	Ch 71
Plenty	Maritime Radio	Ch 68
Runaway	Maritime Radio	Ch 71
Tolaga	Maritime Radio	Ch 67
Napier	Maritime Radio	Ch 68
Wairarapa	Maritime Radio	Ch 67
Taranaki	Maritime Radio	Ch 67
Wellington	Maritime Radio	Ch 71
Picton	Maritime Radio	Ch 68
D'Urville	Maritime Radio	Ch 67
Farewell	Maritime Radio	Ch 68
Kaikoura	Maritime Radio	Ch 67
Akaroa	Maritime Radio	Ch 68
Waitaki	Maritime Radio	Ch 67
Chalmers	Maritime Radio	Ch 71
Westport	Maritime Radio	Ch 71
Greymouth	Maritime Radio	Ch 68
Fox	Maritime Radio	Ch 67
Fiordland	Maritime Radio	Ch 71
Puysegur	Maritime Radio	Ch 67
Bluff	Maritime Radio	Ch 68

*Planned new station 2000.

SINPO CODE

S	signal strength	1. Barely audible 2. Poor 3. Fair 4. Good 5. Excellent
I	interference	1. Extreme 2. Severe 3. Moderate 4. Slight 5. Nil
N	noise	1. Extreme 2. Severe 3. Moderate 4. Slight 5. Nil
P	fading	1. Extreme 2. Severe 3. Moderate 4. Slight 5. Nil
O	overall rating	1. Unusable 2. Poor 3. Fair 4. Good 5. Excellent

for reporting broadcast transmissions

MARITIME SAFETY AUTHORITY OF NEW ZEALAND

Te Mana Ārai Hauata Moana o Aotearoa

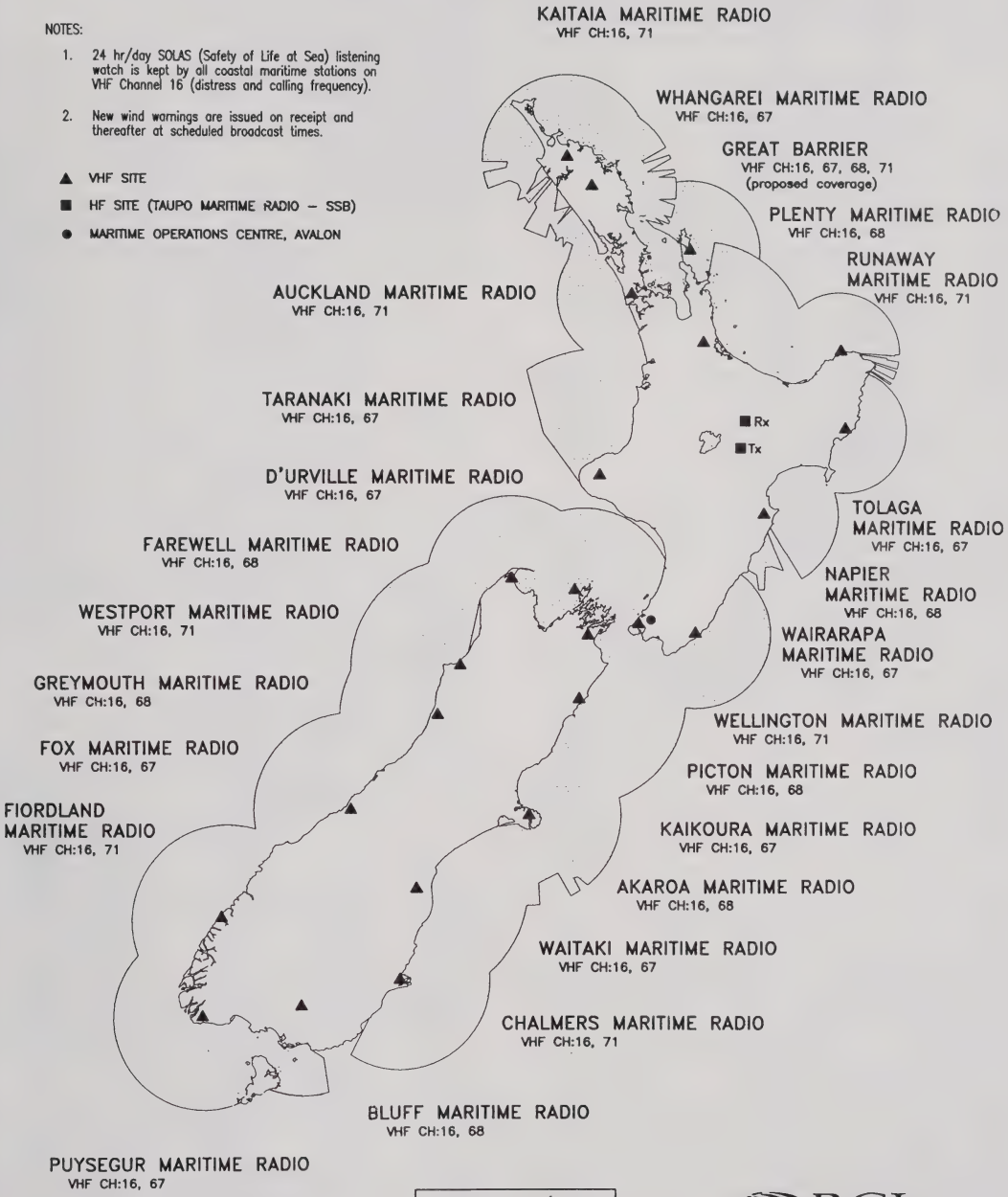
NOTES:

1. 24 hr/day SOLAS (Safety of Life at Sea) listening watch is kept by all coastal maritime stations on VHF Channel 16 (distress and calling frequency).
2. New wind warnings are issued on receipt and thereafter at scheduled broadcast times.

▲ VHF SITE

■ HF SITE (TAUPO MARITIME RADIO – SSB)

● MARITIME OPERATIONS CENTRE, AVALON



MOC Phone / Fax
Phone: (04) 914–5663
Fax: (04) 914–5520

B·C·L
BROADCAST COMMUNICATIONS LIMITED

NEW ZEALAND RADIO SPECTRUM USAGE

This table indicates significant, but not necessarily exclusive, existing and planned usage within New Zealand of ranges of frequencies (ie "bands") by various radio services. It is based on the International Radio Table of Allocations—particularly where international co-ordination is important such as in the aeronautical, maritime, satellite, navigation, spece research, astronomy and amateur services. It should be noted, however, that some spectrum in New Zealand is the subject of privately owned management rights and this table is indicative usage based on such current information held by the Ministry as to the nature of licences issed by the managers of that spectrrum.

Ministry of Economic Development
(Radio Spectrum Division)

9–90	Fixed, Maritime-Mobile and Radionavigation
90–120	Radionavigation (LORAN C)
120–140	Restricted Radiation Devices (RRD)
140–165	Fixed, Maritime-Mobile and Radionavigation
165–190	Fixed, Radionavigation and Amateur
190–285	Aeronautical Beacons
285–325	Aeronautical and Maritime Beacons
325–415	Aeronautical Beacons
415–521	Maritime
521–1612	MF-AM Sound Broadcasting
1612–1690	Aeronautical Beacons, Broadcasting
1690–1800	Cordless Telephone (CT1 Base Tx), Radio Buoys
1800–1950	Amateur 160 m Band
1950–2000	Radio Buoys
2000–2300	Fixed and Mobile
2300–2495	Broadcast 120 m Band (Tropical)
2495–2505	Standard Frequency 2.5 MHz
2505–2850	Fixed and Mobile
2850–3155	Aeronautical
3155–3200	Fixed and Mobile
3200–3400	Broadcast 90 m Band (Tropical)
3400–3500	Aeronautical
3500–3900	Amateur 80 m Band
3900–4000	Broadcast 75 m Band
4000–4438	Maritime
4438–4650	Fixed and Mobile
4650–4750	Aeronautical
4750–4995	Broadcast 60 m Band (Tropical)
4995–5005	Standard Frequency 5 MHz
5005–5060	Broadcast 60 m Band (Tropical)
5060–5480	Fixed and Mobile
5480–5730	Aeronautical
5730–5900	Fixed and Mobile
5900–6200	Broadcast 49 m Band
6200–6525	Maritime
6525–6765	Aeronautical
6765–6795	ISM and RRD
6795–7000	Fixed and Mobile
7000–7100	Amateur 40 m Band
7100–7350	Broadcast 41 m Band, Amateur (7100–7300)
7350–8100	Fixed and Mobile
8100–8815	Maritime
8815–9040	Aeronautical
9040–9400	Fixed
9400–9900	Broadcast 31 m Band
9900–9995	Fixed
9995–10005 MHz	Standard Frequency 10 MHz
10.005–10.100	Aeronautical
10.100–10.150	Amateur 30 m Band
10.150–11.175	Fixed
11.175–11.400	Aeronautical
11.400–11.600	Fixed
11.600–12.100	Broadcast 25 m Band
12.100–12.230	Fixed
12.230–13.200	Maritime
13.200–13.360	Aeronautical
13.360–13.550	Fixed and Mobile
13.550–13.570	ISM and RRD
13.570–13.570	Broadcast 22 m Band
13.870–14.000	Fixed
14.000–14.350	Amateur 20 m Band
14.350–14.990	Fixed
14.990–15.010	Standard Frequency 15 MHz
15.010–15.100	Aeronautical
15.100–15.800	Broadcast 19 m Band
15.800–16.360	Fixed
16.360–17.410	Maritime
17.410–17.480	Fixed
17.480–17.900	Broadcast 16 m Band
17.900–18.030	Aeronautical
18.030–18.068	Fixed
18.068–18.168	Amateur 17 m Band
18.168–18.780	Fixed
18.780–18.900	Maritime
18.900–19.020	Broadcast 15 m Band
19.020–19.680	Fixed
19.680–19.800	Maritime
19.800–19.990	Fixed
19.990–20.010	Standard Frequency 20 MHz
20.010–21.000	Fixed
21.000–21.450	Amateur 15 m Band
21.450–21.850	Broadcast 13 m Band
21.850–21.870	Fixed
21.870–22.000	Aeronautical
22.000–22.855	Maritime
22.855–23.200	Fixed
23.200–23.350	Aeronautical
23.350–24.890	Fixed and Mobile
24.890–24.990	Amateur 12 m Band
24.990–25.010	Standard Frequency 25 MHz
25.010–25.070	Fixed and Mobile
25.070–25.210	Maritime
25.210–25.550	Fixed and Mobile
25.550–25.670	Astronomy
25.670–26.100	Broadcast 11 m Band
26.100–26.175	Maritime
26.175–26.300	Fixed and Mobile

26.300–44.000	26.300			
		Citizen Radio Service "CB" Band		
		CB1	26.330	
		CB40	26.770	
	26.800			
		Fixed and Mobile		
	26.960			
		Paging, ISM (27.120 MHz), RRD		
	27.300			
		Fixed and Mobile		
	28.000			
		Amateur 10 m Band		
	29.700			
		RRD		
	30.000			
		Cordless Telephone "CT1" Band		
		CT1-1	30.075 Base Tx	
		CT-20	30.775 Base Tx	
	30.800			
		Paging 31.3–31.6 MHz, RRD		
	32.000			
		Fixed and Mobile (TV Sound IF 33.40 MHz)		
	35.000			
		ISM 35.4–36.0, RRD Telecontrol and Telemetry 36.0–36.6 MHz		
	37.200			
		Fixed and Mobile (TV Vision IF 38.90 MHz		
	39.000			
		RRD		
	39.700			
		Cordless Telephone "CT1" Band		
		CT1-1	39.776 Mobile Tx	
		CT1-29	40.475 Mobile Tx	
	40.500			
		ISM 40.66–40.7 MHz, RRD		
	41.000			
		Fixed and Mobile		
44.000–68.000	44.000			
		VHF Television Broadcasting (Band I)		
		CHL 1	44–51	
	51.000			
		Amateur 6 m Band		
	53.000			
		Fixed, Mobile and Amateur		
	54.000			
		VHF Television Broadcasting (Band I)		
		CHL 2	54–61	
		CHL 3	61–68	
68.000–74.800	68.000			
		Fixed "AB" Band		
		ABX1	68.0125	Simplex
		ABX159	69.9875	Simplex
		AB1	70.0125	Alpha Tx
		AB143	71.7875	Alpha Tx
		ABX160	71.8125	Simplex
		ABX174	71.9875	Simplex
	72.000			
		RRD and Cordless Telephone "CT1" Band		
		CT1-22	72.800 Mobile Tx	
		CT1-29	72.975 Mobile Tx	
	73.000			
		Fixed "AB" Band		
		AB1	73.0125	Beta Tx
		AB143	74.7875	Beta Tx
74.800–75.200	74.800			
		Aeronautical Marker Beacons		
75.200–80.000	75.200			
		Land Mobile "ESA" Band (Emergency Services)		
		ESA1	75.2250	Base Tx
		ESA86	76-2875	Base Tx
	76.300			
		Not allocated		
	78.100			
		Land Mobile "ESA" Band (Emergency Services)		
		ESA1	78.10625	Mobile Tx
		ESA86	79.16875	Mobile Tx
	79.200			
80.000–88.000	80.000			
		Land Mobile "A" Band		
		AX01	80.0125	Simplex
		AX41	80.5125	Simplex
		A501	80.5250	Base Tx
		A539	81.0000	Base Tx
		A1	81.0125	Base Tx
		A242	84.0250	Base Tx

		AX101	84.0375	Simplex
		AX136	84.4750	Simplex
		A501	84.49375	Mobile Tx
		A539	84.96875	Mobile Tx
		A1	84.98125	Mobile Tx
88.000–108.000	88.000	A242	87.99375	Mobile Tx
	88.800	Guardband, Low Power Sound Broadcasting		
		VHF-FM Sound Broadcasting (Band II)		
		FM110	89.0	
		FM220	100.0	
	100.200			
	100.800	RRD, Wireless Public Address systems		
	100.990	Guardband		
		Land Mobile "B" Band		
		B1	101.0000	Mobile Tx
		B242	104.0125	Mobile Tx
		BX243	104.0250	Simplex
		BX318	104.9625	Simplex
		B1	104.9750	Base Tx
		B242	107.9875	Base Tx
	108.000			
	Draft future plan:			
	88.000			
	88.500	RRD		
	107.500	Sound Broadcasting (FM and/or Digital)		
108.000–137.000	108.000	RRD		
	112.000	Aeronautical ILS Localizers		
	117.975	Aeronautical VOR Beacons		
		Aeronautical Communications (R)		
		ACX1	118.000	
		ACX480	129.975	
	130.000			
		Aeronautical Communications (OR)		
		ARX1	130.025	
		ARX79	131.975	
	132.000			
		Aeronautical Repeater (OR)		
		AR1	132.025	Base Tx
		AR23	132.575	Base Tx
	132.600			
		Aeronautical Communications (OR)		
		ARX80	132.625	
		ARX190	135.375	
	135.400			
		Aeronautical Repeater (OR)		
		AR1	135.425	Mobile Tx
		AR23	135.975	Mobile Tx
	136.000			
137.000–138.000	137.000	Aeronatuical Communications (OR)		
138.000–144.000	138.000	Mobile-Satellite and Meteorological-Satellite, (S-E)		
		Land Mobile "ESB" Band (Emergency Services)		
		ESB1	138.0125	Mobile Tx
		ESB200	140.5000	Mobile Tx
		ESBX1	140.5125	Simplex
		ESBX40	141.0000	Simplex
		ESB1	141-0125	Base Tx
		ESB200	143.5000	Base Tx
		ESBX41	143.5125	Simplex
		ESBX79	143.9875	Simplex
144.000–148.000	144.000	Amateur 2 m Band		
148.000–149.900	148.000	Mobile-Satellite Service (E-S)		
149.900–150.050	149.500	Radionavigation-Satellite (TRANSIT)		
150.050–156.000	150.050	Mobile-Satellite (E-S)		
		Land Mobile "E" Band		
		ENX1	150.0625	Simplex
		ENX75	150.9875	Simplex
		EN22	151.0125	Base Tx
		EN213	153.4000	Base Tx
		ENX76	153.43125	Simplex
		ENX89	153.59375	Simplex
		EN87	153.60625	Mobile Tx
		EN213	155.18125	Mobile Tx
		EN22	155.19375	Mobile Tx
		EN86	155.99375	Mobile Tx
156.000–162.200	156.000			
		Maritime Mobile "MM" Band		
		MM60	156.025	Mobile Tx
		MM7	156.350	Mobile Tx
		MM67	156.375	Simplex
		MM77	156.875	Simplex
		MM18	156.900	Mobile Tx
		MM91	157.575	Mobile Tx
	157.600			
		Wide-Area Paging "WP" Band		
		WPN1	157.6125	
		WPN37	158.0625	
	158.070			
		Land Mobile "MS" Band (Special Services)		
		MS1	158.0750	Mobile Tx
		MS41	158.5750	Mobile Tx
		MSX1	158.6000	Simplex
		MSX120	160.0875	Simplex
	160.100			
	160.600	Telemetry (160.1–160.3) and Paging (160.3–160.6), RRD		
		Maritime Mobile "MM" Band		
		MM60	160.625	Coast Tx
		MM7	160.950	Coat Tx
	160.970			
		Land Mobile "MS" Band		
		MS1	160.9750	Base Tx
		MS40	161.4750	Base Tx
	161.490			
		Maritime Mobile "MM" Band		
		MM18	161.500	Coast Tx
		MM91	162.175	Coast Tx
162.200–174.000	162.200			
		Land Mobile "EE" Band		
		EE1	162.2125	Base Tx
		EE279	165.6875	Base Tx
		EEX1	165.7125	Simplex
		Eex55	166.3874	Simplex
	166.400			
		Wide Area Paging "WP" Band		
		WPN38	166.4125	
		WPN68	166.7875	
	166.800			
		Land Mobile "EE" Band		
		EE1	166.8125	Mobile Tx
		EE279	170.2875	Mobile Tx
		EEX88	170.3125	Simplex
		EEX302	172.9875	Simplex
	173.000			
174.000–230.000	174.000	RRD		
		VHF Television Broadcasting (Band III)		
		CHL 4	174–181	
		CHL 5	181–188	
		CHL 6	188–195	
		CHL 7	195–202	
		CHL 8	202–209	
		CHL 9	209–216	
		CHL 10	216–223	
		CHL 11	223–230	
230.000–404.000	230.000			
		230.00–300.00 International Military		
		300.00–305.00 International Military, RRD		
		305.00–328.60 International Military		
		328.60–335.40 Aeronautical ILS Glidepath		
		335.50–380.00 International Military		
	380.000			
		Land Mobile "ESC" Band (Emergency Services) (under negotiation)		
	383.000			
		383.00–390.00 International Military		
	390.000			
		Land Mobile "ESC" Band (Emergency Services) (under negotiation)		
	393.000			
		393.00–399.90 International Military		
		399.90–400.05 Radionavigation-Satellite (TRANSIT)		
		400-05–400.15 Standard Frequency Satellite		
		400.15–401.00 Meteorological & Met-Satellite (S-E)		
		401.00–404.00 Meteorological		
404.000–430.000	404.000	Fix "IA" Bandff		Alpha Tx
	406.000	Beacon—Satellite Distress Band		
	406.100			
		Land Mobile "TD" Band		
		TD9	406.1125	Mobile Tx
		TD319	409.9875	Mobile Tx
	410.000			
	412.000	Fixed "IB" Band		Alpha Tx
	414.000	Fixed "IA" Band		Beta Tx
		Land Mobile "TD" Band		
		TDX1	414.0125	Simplex
		TDX7	414.0875	Simplex
	414.100			
		Land Mobile "TD" Band		
		TD9	414.1125	Base Tx
		TD319	417.9875	Base Tx
	418.000			
	420.000	Fixed "IB" Band		Beta Tx
	425.000	Fixed "IC" Band		Alpha Tx
430.000–440.000	430.000	Fixed "IC" Band		Beta Tx
440.000–470.000	440.000	Radiolocation, Amateur 70 cm Band		
	448.000	Fixed, Mobile, Radiolocation, Amateur		
	449.000	Radiolocation, Amateur		
	449.750	Fixed "JC" Band		Simplex
		Land Mobile "C" Band		
		CNX1	449.75625	Simplex
		CNX20	449.99375	Simplex
	450.000	Fixed "JC" Band		Simplex
	450.275			
		Land Mobile "C" Band		
		CN1	450.28125	Mobile Tx
		CN242	453.29375	Mobile Tx
		CNX21	453.30625	Simplex
		CNX46	453.61875	Simplex
	453.625			
	454.975	Fixed "JA" Band		Alpha Tx
		Land Mobile "C" Band		
		CNX47	454.98125	Simplex
		CNX73	455.30625	Simplex

	CN1	455.31875	Base Tx
	CN242	458.33125	Base Tx
458.335			
	Land Mobile "D" Band		
	DNX1	458.34375	Simplex
	DNX16	458.53125	Simplex
458.540			
	Paging, RRD		
458.610			
	Land Mobile "D" Band		
	DNX17	458.61875	Simplex
	DNX20	458.65625	Simplex
458.665			
	Fixed "JA" Band		Beta Tx
	Fixed "JD" Band		Alpha Tx
	Fixed "JE" Band		Simplex
461.475			
	Land Mobile "D" Band		
	DNX21	461.48125	Simplex
	DNX47	461.80625	Simplex
	DN1	461.81875	Base Tx
	DN240	464.80625	Base Tx
	DNX48	464.81875	Simplex
	DNX77	465.18125	Simplex
465.190			
	Fixed "JF" Band		Simplex
	Fixed "JD" Band		Beta Tx
	Fixed "JG" Band		Simplex
466.675			
	Land Mobile "D" Band		
	DNX78	466.68125	Simplex
	DNX87	466.79375	Simplex
466.800			
	RRD, Telemetry		
466.850			
	Land Mobile "D" Band		
	DNX88	466.85625	Simplex
	DNX99	466.99375	Simplex
	DN1	467.00625	Mobile Tx
	DN240	469.99375	Mobile Tx
470.000–502.000 470.000			
470.500			
	RRD (Medical Telemetry only)		
	Land Mobile "F" Band		
	FNX101	470.50625	Simplex
	FNX140	470.99375	Simplex
471.000			
	RRD		
471.500			
	Land Mobile "F" Band		
	FNX201	471.50625	Simplex
	FNX240	471.99375	Simplex
	FN1	472.00625	Mobile Tx
	FN320	475.99375	Mobile Tx
	FNX301	476.00625	Simplex
	FNX332	476.39375	Simplex
476.400			
	Personal Radio Services "PRS" Band		
	PRS1	476.425	
	PRS40	477.400	
477.425			
	Land Mobile "F" Band		
	FNX401	477.43125	Simplex
	FNX445	477.98125	Simplex
	FN1	477.99375	Base Tx
	FN320	481.98125	Base Tx
	FNX501	481.99375	Simplex
	FNX660	483.98125	Simplex
	FN321	483.99375	Base Tx
	FN640	487.98125	Base Tx
	FNX701	487.99375	Simplex
	FNX861	489.99375	Simplex
	FN321	490.00625	Mobile Tx
	FN640	493.99375	Mobile Tx
	FP1	494.01875	Mobile Tx
	FP279	497.49375	Mobile Tx
	FPX1	497.5125	Simplex
	FPX39	497.9875	Simplex

NOTE: The Spectrum plan shown for 494–518 MHz is draft only and subject to further consideration and consultation.

	FP1	498.0125	Base Tx
	FP279	501.4875	Base Tx
	FPX101	501.5125	Simplex
502.000–806.000 502.000	FPX139	501.9875	Simplex
	UHF Television Broadcasting (Bands IV and V)		
	E25	502–510	Block 0
	E26	510–518	
	E27	518–526	Block 1
	E28	526–534	
	E29	534–542	
	E30	542–550	
	E31	550–558	Block 2
	E32	558–566	
	E33	566–574	
	E34	574–582	
	E35	582–590	Block 3
	E36	590–598	(Govt
	E37	598–606	reserved)
	E38	606–614	
	E39	614–622	Block 4
	E40	622–630	(Govt
	E41	630–638	reserved)
	E42	638–646	
	E43	646–654	Block 5
	E44	654–662	
	E45	662–670	
	E46	670–678	
	E47	678–686	Block 6
	E48	686–694	
	E49	694–702	
	E50	702–710	
	E51	710–718	Block 7
	E52	718–726	
	E53	726–734	
	E54	734–742	
	E55	742–750	Block 8
	E56	750–758	
	E57	758–766	
	E58	766–774	
	E59	774–782	Block 9
	E60	782–790	
	E61	790–798	
	E62	798–806	
806.000–890.000 806.000			
	Fixed "KK" Band		Alpha Tx
812.000			
	Land Mobile "ESD" Band (Emergency Services)		
	ESD241	812-0125	Mobile Tx
	ESD280	812.9875	Mobile Tx
813.000			
	Expansion of ES or TS Bands		
814.000			
	Land Mobile "TS" Band (Trunked Despatch)		
	TS321	814.0125	Mobile Tx
	TS520	818.9875	Mobile Tx
819.000			
	RRD		
824.000			
825.015	Not allocated (AMPS extension Channels 991–1023)		
	AMPS/DAMPS Cellular Band (Private Management Right)		
	AMPS1	825.030	Mobile Tx
	AMPS666	844.980	Mobile Tx
845.000			
	Alternative pairing with 890–894 MHz for US cellular		
849.000			
	Not allocated		
851.000			
	Fixed "KK" Band		Beta Tx
857.000			
	Land Mobile "ESD" Band (Emergency Services)		
	ESD241	857.0125	Base Tx
	ESD280	857.9875	Base Tx
858.000			
	Expansion for ES or TS Bands		
850.000			
	Land Mobile "TS" Band (Trunked Despatch)		
	TS321	859.0125	Base Tx
	TS520	863.9875	Base Tx
864.000			
	Cordless Telephone "CT2" Band		
	CT2-1	864.150	
	BS2-40	868.050	
868.100			
	Land Mobile "TX" Band		
	TX1	868.1125	Simplex
	TX37	869.0125	Simplex
869.025			
870.015	Not allocated (AMPS extension channels 991–1023)		
	AMPS/DAMPS Cellular Band (Private Management Right)		
	AMPS1	870.030	Base Tx
	AMPS666	889.980	Base Tx
890.000–960.000 890.000			
	GSM Cellular Band (Private & Crown Management Rights)		
	GSM1	890.200	Mobile Tx
	GSM124	914.800	Mobile Tx
915.000			
	Fixed "K" Band (Studio-Transmitter Links)		
921.000			
	ISM, RRD, Amateur		
929.000			
	Fixed "K" Band (Studio-Transmitter Links)		
931.700			
	Paging "KP" Band		
	KP1	931.7125	
	KP12	931.9875	
932.000			
	Fixed "K" Band (Studio-Transmitter Links)		
935.000			
	GSM Cellular Band (Private & Crown Management Rights)		
	GSM1	935.200	Base Tx
	GSM124	959.800	Base Tx
960–1427 960.000			
	960–1215 Aeronautical Radionavigation		
	1215–1240 Radiolocation and Radionavigation		
	12.40–1300 Radiolocation and Amateur		
	1300–1400 Radiolocation and Radionavigation		
	1400–1427 Astronomy and Space Research		
1427–1525 1427			
	1427–1465 Fixed "L" Band (Alpha Tx)		
	1465–1485 Broadcasting and Broadcasting-Satellite		
	1485–1525 Fixed "L" Band (Beta Tx)		

1525–1710	1525	
		1525–1559 Mobile Satellite (S-E) (incl INMARSAT)
		1559–1610 Radionavigation-Satellite (S-E) (eg GPS)
		1610–1626.5 Mobile-Satellite (E-S) (see 2483.5 MHz)
		1626.5–1660.5 Mobile Satellite (E-S) (incl. INMARSAT)
		1660.5–1670 Astronomy, Space Research, & Met Aids
		1670–1675 Aeronautical Public Correspondence (APC)
		1675–1710 Meteorological-Satellites (S-E) (eg TIROS)
1710–2300	1710	
		1710–1720 Not allocated
		1720–1805 Fixed "M" Band (Alpha Tx)
		1805–1810 Not allocated
		1810–1895 Fixed "M" Band (Beta Tx)
		1895–2300 Fixed "N" Band
		(Note: Current use of this band is likely to change significantly with the introduction of PCS/MSS and FPLMTS services.)
2300–2396	2300	
		MDS Band (12 × 8 MHz Private Management Rights)
2396–2500	2396	
		2396–2400 Amateur
		2400–2450 ISM, RRD and Amateur
		2450–2483.5 ISM and RRD
		2483.5–2500 ISM and Mobile-Satellite (S-E) (see 1610 MHz)
2500–2690	2500	
		2500–2690 Fixed "O" Band
2690–3400	2690	
		2690–2700 Astronomy and Space Research
		2700–3300 Radiolocation/Navigation (Weather radar)
		3300–3400 Radiolocation and Amateur
3400–4200	3400	
		3400–3600 Fixed "PB" Band and Amateur (3400–3500)
		3600–4200 Fixed "P" Band & Fixed-Satellite (S-E) (INTELSAT)
4200–5875	4200	
		4200–4400 Aeronautical Radionavigation
		4400–5000 Fixed "PC" Band
		5000–5650 Radiolocation/Navigation (MLS 5000–5250)
		5650–5875 Radiolocation, ISM & RRD (5725–5875) & Amateur (5650–5850)
5875–8500	5875	
		5875–5925 Fixed "RB" Band
		5925–6420 Fixed "R" Band & Fixed-Satellite (S-E) (INTELSAT)
		6420–7100 Fixed "T" Band
		7100–7425 Fixed "V" Band
		7425–7730 Fixed "U" Band
		7730–8290 Fixed "W" Band
		8290–8500 Fixed "Y" Band
8.50–10.50 GHz	8.50	
		8.50–10.00 Radiolocation/Navigation
		10.00–10.50 Radiolocation and Amateur
10.50–13.25	10.50	
		10.50–10.68 Fixed "H" Band
		10.68–10.70 Astronomy and Space Research
		10.70–11.70 Fixed "Z" Band
		11.70–12.20 Broadcasting Satellite and MDS
		12.20–12.50 Fixed "Q" Band and Fixed-Satellite (S-E)
		12.50–12.75 Fixed "S" Band and Fixed-Satellite (S-E)
		12.75–13.25 Fixed "X" Band
13.25–14.00	13.25	
		13.25–13.40 Aeronautical Radionavigation
		14.30–14.00 Radiolocation
14.00–15.35	14.00	
		14.00–14.50 Fixed-Satellite (S-E)
		14.50–15.35 Fixed "15G" Band
15.35–17.30	15.35	
		15.35–15.40 Astronomy and Space Research
		15.40–15.70 Aeronautical Radionavigation
		15.70–17.30 Radiolocation
17.30–23.60	17.30	
		17.30–17.70 Fixed-Satellite (E-S)
		17.70–19.70 Fixed "18G" Band
		19.70–21.20 Fixed-Satellite, Mobile-Satellite (S-E)
		21.20–23.60 Fixed "23G" Band, Broadcast-Satellite (21.4–22.0)
23.60–25.25	23.60	
		23.60–24.00 Astronomy and Space Research
		24.00–24.05 Amateur
		24.05–24.25 Radiolocation, Amateur, ISM (24.125) and RRD
		24.25–25.25 Radionavigation
		25.25–31.30 Not allocated (LMCS under consideration)
		31.30–37.00 Astronomy, Space Research and Radionavigation
37.00–60.00	37.00	
	40.00	37.00–40.00 Fixed "38G" Band
		40.00–47.00 Not allocated
		47.00–47.20 Amateur
		47.20–50.40 Not allocated
	50.40	50.40–51.15 Fixed "50G" Band
	41.15	
		51.15–51.40 Not allocated
		51.40–54.25 Space Research
		54.25–57.20 Not allocated
	57.20	57.20–58.20 Fixed "60G" Band

NEW ZEALAND TELEVISION BROADCASTING CHANNELS

Channels 1 to 3 are VHF Low Band (Band I—44 to 68 MHz).

Channels 4 to 11 are VHF High Band (Band III—174 to 230 MHz).

Channels 27 to 62 are UHF Band (Band IV and V—518 to 806 MHz).

Transmissions conform to 625 line CCIR System B on VHF and System G on UHF with PAL colour.

The vision carrier frequency is nominally 1.25 MHz above the lower channel edge (an offset between –26 kHz and +26 kHz from the nominal may apply); the rest frequency of the analogue FM sound carrier is 5.4996 MHz above the vision carrier frequency; the centre frequency of the NICAM digital sound carrier (if transmitted) is 5.850 MHz above the vision carrier frequency. The B/G variant of 728 NICAM is used which has a total occupied bandwidth of 510 kHz.

Channel Number	Frequency Limits (MHz)	Vision Carrier (MHz)	FM Sound Carrier (MHz)	NICAM Sound Carrier (MHz)
VHF				
1	45 to 51	45.25	50.75	51.10
2	54 to 61	55.25	60.75	61.10
3	61 to 68	62.25	67.75	68.10
4	174 to 181	175.25	180.75	181.10
5	181 to 188	182.25	187.75	188.10
6	188 to 195	189.25	194.75	195.10
7	195 to 202	196.25	201.75	202.10
8	202 to 209	203.25	208.75	209.10
9	209 to 216	210.25	215.75	216.10
10	216 to 223	217.25	222.75	223.10
11	223 to 230	224.25	229.75	230.10
UHF				
27	518 to 526	519.25	524.75	525.10
28	526 to 534	627.25	532.75	533.10
29	534 to 542	535.25	540.75	541.10
30	542 to 550	543.25	548.75	549.10
31	550 to 558	551.25	556.75	557.10
32	558 to 566	559.25	564.75	565.10
33	566 to 574	567.25	572.75	573.10
34	574 to 582	575.25	580.75	581.10
35	582 to 590	583.25	588.75	589.10
36	590 to 598	591.25	596.75	597.10
37	598 to 606	599.25	604.75	605.10
38	606 to 614	607.25	612.75	613.10
39	614 to 622	615.25	620.75	621.10
40	622 to 630	623.25	628.75	629.10
41	630 to 638	631.25	636.75	637.10
42	638 to 646	639.25	644.75	645.10
43	646 to 654	647.25	652.75	653.10
44	654 to 662	655.25	660.75	661.10
45	662 to 670	663.25	668.75	669.10
46	670 to 678	671.25	676.75	677.10
47	678 to 686	679.25	684.75	685.10
48	686 to 694	687.25	692.75	693.10
49	694 to 702	695.25	700.75	701.10
50	702 to 710	703.25	708.75	709.10
51	710 to 718	711.25	716.75	717.10
52	718 to 726	719.25	725.75	726.10
53	726 to 734	727.25	732.75	733.10
54	734 to 742	735.25	740 75	741.10
55	742 to 750	743.25	748.75	749.10
56	750 to 758	751.25	756.75	757.10
57	758 to 766	759.25	764.75	765.10
58	766 to 774	767.25	772.75	773.10
59	774 to 782	775.25	780.75	781.10
60	782 to 790	783.25	788.75	789.10
61	790 to 798	791.25	796.75	797.10
62	798 to 806	799.25	804.75	805.10

The 20-year management rights for Channels 27 to 34 and 43 to 62 have been sold to a number of television broadcast companies.

Channels 35 to 38 are currently used for Aeronautical Radionavigation (Radar).

Channel 39 is used for Amateur Television and Amateur Narrow Band Modes, see FMTAG Bandplan.

Channel 40 to 42 are used for low power television.

MOUNTAIN RADIO SERVICES IN NEW ZEALAND

In New Zealand the opportunity exists for many to take the hills. To help those who do so there are several Mountain Radio Services who hire lightweight mountain radios for people to communicate back to a town base or to other parties in the field. These mountain radio services are non-profit organizations who just charge sufficient for their services to cover their operating expenses.

The radios are single sideband and operate just below the 80 m band on 3261 kHz in the South Island and 3345 kHz in the North Island. Many radios are also equipped to operate on the DoC National Park channels. The radios are used with a longwire half-wave dipole and with careful setting up are capable of communicating with the base stations from anywhere in the country.

The radios may be obtained from the following organizations:

Canterbury Mountain Radio Service—call-sign ZKIB, 7 Walker Street, PO Box 22-342, CHRISTCHURCH. Telephone (03) 332-5846, Fax (03) 366-5241.

Central North Island Mountain Radio Service—call-sign ZKBY, 44 Rotokawa Street, TAUPO. Telephone, Fax (07) 378-9676, (07) 386-6163.

Hawkes Bay Mountain Radio Service—call-sign ZLKU, 12 Upham Crescent, TARADALE. Telephone (06) 844-2797.

Marlborough Mountain Radio Services Inc.—call-sign ZKMM, 64 Park Terrace, BLENHEIM. Telephone (03) 578-5311.

Northland Mountain Radio Service—call-sign ZKVS, PO Box 1410, WHANGAREI. Telephone (09) 437-5347.

Southland Field Radio—call-sign ZLFK, Mill Road South, RD 1, SOUTHLAND. Telephone (03) 216-3751. Fax (03) 218-3305.

Wellington Mountain Radio Service—call-sign ZLJG, PO Box 30-519, WELLINGTON. Telephone/Fax (04) 564-6929.

Contact with the base stations is made at fixed schedule times in the evening. For example, Canterbury 7.30pm, Southland 8.00pm. But many have a continuous watch during the day and emergency calls may be sent at any time. At scheduled times weather forecasts and messages are relayed to the field radio. It is not unusual to have 30 or more stations on the nets.

The principal hire radios are type MRS1 which were developed and built by mountain radio personnel. These are supplemented by Codan 8332 and AWA TR-105 types.

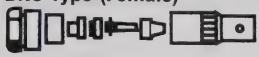
The Mountain Radio Services have been in operation now for over 25 years and it is recommended that those persons venturing into the mountains carry a mountain radio.

AT SEA
SAFETY IS NO
ACCIDENT

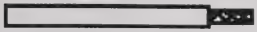
CHECK
YOUR
EQUIPMENT

COAXIAL PLUG ASSEMBLY

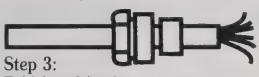
BNC Type (Female)



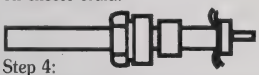
Step 1:
Cut end of cable evenly and remove 8 mm of outer sheat.



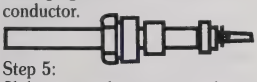
Step 2:
Side clamp nut and pressure sleeve over cable, and comb out braid.



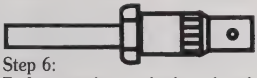
Step 3:
Fold braid back and insert ferrule between braid and dielectric. Trim off excess braid.



Step 4:
Remove 5 mm of dielectric without damaging centre conductor. Tin conductor.

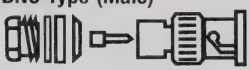


Step 5:
Slide rear insulator over conductor hard against rear insulator. Solder contact to conductor.

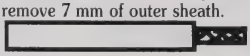


Step 6:
Fit front insulator in body and push sub-assembly onto body. Slide pressure sleeve into body and screw in the clamp nut to clamp cable.

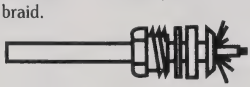
BNC Type (Male)



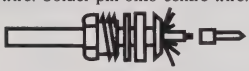
Step 1:
Cut end of cable evenly, and remove 7 mm of outer sheath.



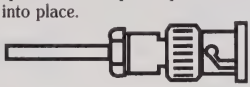
Step 2:
Slide clamp-nut, washer and rubber spacer over cable. Slide pressure sleeve over braid, and fan out braid.



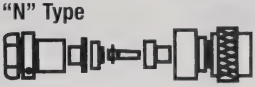
Step 3:
Fold back braid against pressure sleeve and trim off excess. Strip 4 mm of inside insulation off centre wire. Solder pin onto centre wire.



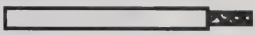
Step 4:
Fit assembly, pin first, into main receptacle. Push washer, rubber spacer and clamp nut up and screw into place.



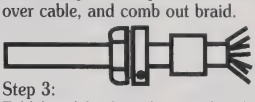
"N" Type



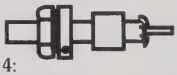
Step 1:
Cut end of cable evenly and remove 9 mm of outer sheath.



Step 2:
Slide clamp nut and pressure sleeve over cable, and comb out braid.



Step 3:
Fold braid back and insert ferrule between braid and dielectirc. Trim off excess braid and remove 5.5 mm dielectric without damaging inner conductor. Tin end of conductor.

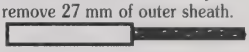


Step 4:
Slide rear insulator over conductor and position against end of dielectric. Slide contact over conductor until hard against rear insulator. Solder contact to conductor.

Step 5:
Fit front insulator in body and push sub-assembly into body. Slide pressure sleeve into body and screw in the clamp nut to clamp cable.

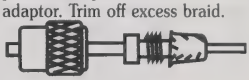
UHF Type

Step 1:
Cut end of cable evenly and remove 27 mm of outer sheath.

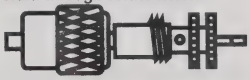


Step 2:
Slide coupling ring and adaptor onto sheath. Fan braid back over sheath.

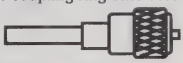
Step 3:
Compress braid around cable and position adaptor so braid fans over adaptor. Trim off excess braid.



Step 4:
Remove 12.5 mm dielectric and tin conductor. Screw the plug assembly onto cable and solder plug to braid through solder holes.



Step 5:
Solder conductor to centre pin and screw coupling ring onto assembly.



COAXIAL CABLE SPECIFICATIONS

Type	Nom. Imp Zo	Outer Dia (mm)	Nominal Attenuation (dB/100 m) 50 MHz	100 MHz	200 MHz	400 MHz	1 GHz	Vel Factor %	Cap pF/m	Volts Vrms
RG-8/U	52	10.3	5.2	7.2	10.5	15.4	29.2	66.0	96.8	5000
RG-9/U	51	10.67	5.2	7.2	10.5	15.4	29.2	66.0	67.3	5000
RG-11/U	75	10.29	4.3	6.6	9.5	13.8	22.3	66.0	67.3	5000
RG-58/U	53.5	4.95	10.2	14.8	22.3	32.8	55.8	66.0	93.5	1900
RG-58A/U	50	4.95	10.8	16.1	23.9	37.7	70.5	66.0	101.0	1900
RG-58C/U	50	4.95	10.8	16.1	23.9	37.7	70.5	66.0	101.0	1900
RG-59/U	73	6.15	7.9	11.2	16.1	23.3	39.4	66.0	68.9	2300
RG-59B/U	75	6.15	7.9	11.2	16.1	23.0	39.4	66.0	67.3	2300
RG-62/U	93	6.04	6.2	8.9	12.5	17.7	28.5	84.0	44.3	700
RG-62B/U	93	6.15	6.6	9.5	13.8	20.0	36.1	84.0	44.3	700
RG-122/U	50	4.06	14.8	23.0	32.8	49.9	87.0	66.0	101.0	1900
RG-141A/U	50	4.06	6.9	10.5	15.4	22.6	41.7	69.5	95.1	1900
RG-142B/U	50	4.95	8.9	12.8	18.4	26.9	44.3	69.5	95.2	1900
RG-174/U	50	2.56	21.7	29.2	39.4	57.4	98.4	66.0	101.0	1500
RG-178B/U	50	1.83	34.4	45.9	62.3	91.9	150.9	69.5	95.1	1000
RG-178B/U	75	2.54	27.9	32.8	41.0	52.5	78.7	69.5	64.0	1200
RG-180B/U	95	3.56	15.1	18.7	24.9	35.1	55.8	69.51	49.2	1500
RG-187A/U	75	2.66	37.9	32.8	41.0	52.5	78.7	69.5	64.0	1200
RG-188A/U	50	2.59	31.5	37.4	46.6	54.8	101.7	69.5	95.2	1200
RG-196A/U	50	1.93	34.4	45.9	62.3	91.9	150.9	95.2	1200	
RG-213/U	50	10.29	5.2	7.2	10.5	15.4	29.2	66.0	101.0	5000
RG-214/U	50	10.8	5.2	7.2	10.5	15.4	29.2	66.0	101.0	5000
RG-223/U	50	5.38	10.1	14.8	21.0	30.2	63.5	66.0	101.0	1900
RG-303/U	50	4.31	6.9	10.5	15.4	22.6	42.7	69.5	95.2	1900
RG-316/U	50	2.49	30.8	34.1	43.3	54.1	101.7	69.5	95.2	1200
BEL 9913	50	10.29	3.0	4.5	5.9	8.5	14.8	84.0	78.7	—

NB: Except for Belden 9913, all specifications are referenced to MIL-C-17D/F or JAN-C-17A as applicable.

COMMONLY USED SYMBOLS AND ABBREVIATIONS

A

A	ampere, amplification factor
AC	alternating current
A/D	analogue-to-digital
AF	audio frequency
afc	automatic frequency control
afsk	audio frequency shift keying
agc	automatic gain control
Ah	ampere hour
alc	automatic load (or level) control
AM	amplitude modulation
a.m.	morning
AMSAT	Radio Amateur Satellite Corporation
AMTOR	Amateur Teleprinting Over Radio
anl	automatic noise limiter
ant	antenna
AOS	acquisition of signal
ARA	Amateur Radio Association
ARC	Amateur Radio Club
AREC	Amateur Radio Emergency Corps
ARS	Amateur Radio Society; Amateur Radio Station
ASCII	American National Standard Code for Information Interchange
ATV	amateur television
avc	automatic volume control
AWG	American wire gauge
az-el	azimuth-elevation

B

B	flux density; susceptance
BASIC	Beginner's All-purpose Symbolic Instruction Code (computer language)
b	byte (a group of bits or binary digits, usually eight)
bc	broadcast
BCD	binary-coded-decimal
BCI	broadcast interference
bcl	broadcast listener
bd	baud (bits/sec)
ber	bit error rate
bit	binary digit
BFO	beat-frequency oscillator
bpf	band pass filter
bw	bandwidth
byte	computer word, 8 bits

C

C	Celsius, capacity, Coulomb
c	velocity of EM waves
CATV	cable television
CB	citizens band
CCIR	International Radio Consultative Committee
CCIT	Consultative Committee for International Telegraph and Telephone (ITU)
CCS	constant current source
cctv	closed circuit television
ccw	coherent CW; counter-clockwise
CD	Civil Defence
Ch	channel
cm	centimetre
CMOS	(or COSMOS)—complimentary-symmetry metaloxide semiconductor
coax	coaxial cable or connector
COR	carrier-operated relay
CPU	central processing unit
CQ	general call to all stations
CRT	cathode-ray tube
ct	centre tap
CTCSS	continuous tone coded squelch system
CW	continuous wave (code); clockwise

D

D	electrostatic displacement; flux density
D/A	digital-to-analogue
dB	decibel
dBd	antenna gain referenced to a dipole
DBDM	double-balance diode mixer
dBi	antenna gain referenced to an isotropic, a dipole has a gain of 2.14 dBi
dBm	decibel referred to 1 milliwatt
dBW	decibel referred to 1 watt
DC	direct current
det	detector
DF	direction finder; direction finding
DIP	dual-in-line package, 14 to 16 pins
dpdt	double-pole double-throw
dpst	double-pole single-throw
dsb	double sideband
DTL	diode-transistor logic
DTMF	dual tone multi-frequency
DVM	digital voltmeter
DX	long distance
DXCC	DX Century Club

E

E	voltage
e	base of Naperian logs
ECL	emitter-coupled logic
ECO	electron-coupled oscillator
EHF	extra high frequency (30– 300 GHz)
EHT	extra high tension
eirp	effective isotropic radiated power
EMC	electro-magnetic capability
E-M-E	earth-moon-earth (moonbounce)
emf	electromotive force (voltage)
EMI	electro-magnetic interference
EMP	electromagnetic pulse
EPROM	erasable programmable read-only memory
EUV	extreme ultra-violet radiation
EQX	equator crossing
erp	effective radiated power

F

f	frequency
F	farad; Fahrenheit
FAX	facsimile
FCC	Federal Communications Commission
FD	Field Day
FET	field-effect transistor
FF	flip-flop
FM	frequency modulation
FMT	frequency measuring test
FMTAG	Frequency Management Technical and Advisory Group
fot	optimum working frequency
fsd	full scale deflection
FSK	frequency-shift keying

G

g	gram
G	giga (109); conductance; magneto motive force
GaAs FET	gallium arsenide field-effect transistor
GDO	grid-dip or gate-dip oscillator
GHz	gigahertz
gnd	ground

H

H	henry; magnetic field strength
HAAT	height above mean terrain
HF	high frequency (3–30 MHz)
HFO	heterodyne-frequency oscillator
hpf	highest possible frequency; high pass filter
HT	high tension
Hz	hertz

I

I	current
IARU	International Amateur Radio Union
IC	integrated circuit
i-d	identification; identifier
ID	inside diameter
IF	intermediate frequency
IMD	inter-modulation distortion
I/O	input/output
IRC	international reply coupon
ISB	independent sideband
ITU	International Telecommunication Union
IW	Intruder Watch (Monitoring Service)

J

J	Joule
j	indicator for reactive component of an impedance; (+j inductive; –j capacitive); joule
JFET	junction field-effect transistor

K

k	kilo (1000)
K	kilobyte; specific inductive capacity; Kelvin; dielectric constant
kg	kilogram
kHz	kilohertz (103)
km	kilometre
kV	kilovolt
kW	kilowatt
kWh	kilowatt hour

L

L	self inductance
LC	inductance-capacitance
LCD	liquid crystal display
LED	light-emitting diode
LF	low frequency (30–300 kHz)
lhcp	left-hand circular polarisation
LMO	linear master oscillator
LO	local oscillator
loran	long-range navigation
LOS	loss of signal
lp	long periodic; long path
LSB	lower sideband; least signifcant bit
LSI	large-scale integration
LT	low tension
luf	lowest usable frequency
lw	longwave; long wire

M

m	metre (distance or band); milli (10^{-3}); mass
M	mega (10^{6}); mutual inductance
mA	milliampere (one-thousandth of an Amp)
mAH	milliampere hour
MARS	Military Affiliate Radio System
MATV	multi-access television
MF	medium frequency (300–3000 kHz)
mH	millihenry
MHz	megahertz (106)
mike; mic	microphone
mini-DIP	dual-in-line package of 8 pins
mi/h	miles per hour
mi/s	miles per second
mix	mixer
mm	millimetre
MO	master oscillator
MOS	metal oxide semiconductor
mod	modulator
modem	modulator/demodulator
MOX	manually operated switching
ms	millisecond
m.s.	meteor scatter
m/s	metres per second
MSB	most significant bit
MSI	medium-scale integration
MSTV	medium-scan television
MUF	maximum usable frequency
MUX	multiplex; multiplexer
mV	millivolt
mW	milliwatt

N

N	modulation factor
n	nano (10–9)
nbfm	narrow-band frequency modulation
nbvm	narrow-band voice modulation
n.c.	no connection
NC	normally closed
NF	noise figure
NiCad	nickel cadmium
NL	noise limiter
NMOS	n-channel MOS
NO	normally open
npn	negative-positive-negative
nS	nanosecond
NZART	New Zealand Association of Radio Transmitters

O

OD	outside diameter
OM	old man
op amp	operational amplifier
osc	oscillator
OSCAR	Orbiting Satellite Carrying Amateur Radio
OTC	Old Timers' Club
oz	ounce

P

p	pico (10–12)
P	power
PA	power amplifier; public address system
PAM	pulse amplitude modulation
PCB	printed (or etched) circuit board
PCM	pulse code modulation
PEP	peak envelope power
pF	picofarad
ph	phone
PIN	positive intrinsic negative
PIV	peak inverse voltage
pk	peak
pk-pk	peak to peak
PLL	phase-locked loop
PM	phase modulation
p.m.	afternoon/night
PMOS	p-channel MOS
pnp	positive-negative-positive
ppi	plan position indicator (radar)
pot	potentiometer
PROM	programmable read-only memory
PRV	peak reverse voltage
PSK	phase-shift keying
PTO	permeability-tuned oscillator
PTT	push-to-talk
PSU	power supply unit

Q

Q	figure of merit (tuned circuits); charge; quantity
QRP	low power (less than 10 watts input)
QTHR	address correct in *Call Book*

R

R	resistance
RAM	random access memory
R/C	radio control
R-C	resistor-capacitor
rcvr	receiver
rev/min	revolutions per minute
RF	radio frequency
RFC	radio-frequency choke
RFI	radio-frequency interference
rhcp	right-hand circular polarisation
RI	Radio Inspector
RIT	receiver incremental tuning
RLC	resistor, inductance, capacitor network
rms	root-mean-square
RO	Radio Officer
ROM	read-only memory
rptr	repeater
RS	Radiosport Satellite (USSR)
RSGB	Radio Society of Great Britain
RST	readability-strength-tone
RT	radiotelephone
RTL	resistor-transistor logic
RTTY	radioteletype
Rx	receiver

S

S	second; magnetic reluctance; Siemens
SAE	self-addressed envelope
SASE	stamped SAE
SCR	silicon-controlled rectifier
SHF	super-high frequency (3–30 GHz)
SINAD	Ratio of Signal to Noise and Distortion
SM	silver mica (capacitor)
SNR; S/N	signal-to-noise ratio
spdt	single-pole double-throw
spst	single-pole single-throw
SS	sweepstakes; spread spectrum
SSB	single sideband
SSC	AMSAT Phase III special service channels
SSI	small-scale integration
SSTV	slow-scan television
STSP	short-term special purpose (FM repeaters)
SWL	shortwave listener
SWR	standing-wave ratio
sync	synchronous; synchronising
SYNCART	synchronous satellite carrying Amateur Radio Transponder

T

t	time; temperature C
T	period; temperature K
TA	technical adviser
TCA	time of closest approach
TE	trans-equatorial (propagation)
tfc	traffic
THz	tetrahertz (1012)
THD	total harmonic distortion
tpi	turns per inch
T-R	transmit-receive
TTL; T2L	transistor-transistor logic
TTY	teletypewriter (from Teletype, the trade mark of Teletype Corporation)
TV	television
TVI	television interference
Tx	transmitter

U

UHF	ultra-high frequency (300–3000 MHz)
UJT	uni-junction transistor
UoSAT	University of Surrey educational/research satellite (Great Britain)
USB	upper sideband
UTC	Universal Co-ordinated Time
uV	ultra-violet light

V

V	volt; voltage
VA	Volt-Ampere
VCO	voltage-controlled oscillator
VCR	video cassette recorder
VCXO	voltage-controlled crystal oscillator
VFBO	variable-frequency beat oscillator
VFO	variable frequency oscillator
VHF	very-high frequency (30–300 MHz)
VLSI	very large scale integration
VOM	volt-ohm-milliammeter
VOX	voice-operated switching
VR	voltage regulator
VSWR	voltage standing-wave ratio
VTVM	vacuum-tube voltmeter
VU	volume unit
VXO	variable crystal oscillator

W

W	watt; work
WAC	Worked All Continents
WARC	World Administrative Radio Conference
WAS	Worked All States
wbfm	wide-band FM
Wh	watt-hours
wpm	words per minute
ww	wire wound; wire wrap
wx	weather

X

X	reactance; electrostatic field strength
xcvr	transceiver
XO	crystal oscillator
xfmr	transformer
xmtr	transmitter
xtal	crystal
XYL	wife

Y

Y	admittance
YF	wife
YL	young lady or lady operator

Z

Z	impedance; UTC time

Conversion Factors (Metric-Imperial)

1 millimetre (mm)	= 0.03937 inch
1 centimetre (cm) = 10mm	= 0.3937 inch
1 metre (m) = 100cm	= 39.37 inches, 3.28 feet, 1.094 yards
1 kilometre (km) = 1000m	= 3280.8 feet, 1094 yards, 0.621 miles
1 gram (g) = 1000mg	= 0.03574 ounces
1 kilogram (kg) = 1000g	= 2.2046 pounds
1 tonne (t) = 1000kg	= 0.98 ton, 2204.6 pounds
1 cubic centimetre (cm^3) = 1000mm^3	= 0.6102 cubic inches
1 cubic metre (m^3)	= 35.3 cubic feet, 1.3 cubic yards
1 litre (l)	= 0.220 imperial gallons, 0.264 US gallons
1 kilopascal (kP)	= 0.145 lbs/sq. inch, 0.009867 atmospheres
1 kilojoule (kJ)	= 0.948 BTU, 0.239 kilocalories, 737.56ft/lb
1 kilowatt (kW)	= 1.34 horsepower, 73.7ft.lb/sec
1 Newton (N)	= 0.2248lb force
1 Tesla (T)	= 10,000 gauss
1 Weber (W)	= 10^8 Maxwell

Prefixes for Multiples and Sub-multiples of Quantities

Multiple or Sub-multiple	Name	Prefix
10^{12}	Tera	T
10^9	Giga-	G
10^6	Mega-	M
10^3	Kilo-	k
10^2	Hecto	h
10	Deca	da
10^{-1}	Deci	d
10^{-2}	Centi-	c
10^{-3}	Milli-	m
10^{-6}	Micro-	μ
10^{-9}	Nano-	n
10^{-12}	Pico-	p
10^{-15}	Femto	f
10^{-18}	Atto-	a

Preferred Number Series

(a) 10% Tolerance E12

10	12	15	18	22	27	33	39	47	56	68	82

(b) 5% Tolerance E24

10	11	12	13	15	16	18	20	22	24	27	30
33	36	39	43	47	51	56	62	68	75	82	91

DC resistance of conducting materials relative to copper

Material	Resistance Ratio	Material	Resistance Ratio
Aluminium	1.6	Nichrome	63.0
Brass	3.8	Nickel	4.1
Cadmium	4.1	Phosphor Bronze	6.7
Chromium	12.0	Platinum	6.4
Copper	1.0	Silver	0.97
Gold	1.4	Stainless Steel	43.0
Iron	5.9	Tin	6.6
Lead	12.0	Zinc	3.6

Useful Formulae

- Wavelength (in metres)
  Free space = 300/f(MHz)
  Half-wave wire dipole = 143/f(MHz)
- Resonant frequency of an LC circuit
  $f = 0.159155/\sqrt{(LC)}$
- The quality factor or Q of a circuit at resonance is
  $Q = 2 \pi f L/r$
- The 3 dB bandwidth of such a single tuned circuit
  B = f(res)/Q
- Estimate of transformer rating
  Output = 31 A^2 Watts
  where A = core cross-section in sq.ins.
  or Output = 4.8 A^2 Watts if A is in sq.cm.

Ohms Law

$V = IR = W/I = \sqrt{WR}$
$I = V/R = W/V = \sqrt{W/R}$
$R = V/I = V^2/W = W/I^2$
$W = VI = I^2 R = V^2/R$

Mains Plug Wiring

Phase	Brown	Red
Neutral	Blue	Black
Earth	Green/Yellow	Green

Average, Peak, RMS Values

	Multiplication factor for sine wave			
	Average	RMS	Peak	Peak-Peak
Average	—	1.1133	1.573	3.143
RMS	0.933	—	1.414	2.828
Peak	0.637	0.7073	—	2.033
Peak-Peak	0.323	0.3535	0.533	—

Colour Codes

Tantalum Capacitors

Top/Middle band: Value in μF (2 digits)

Middle Spot: Multiplier

Bottom band: Maximum voltage

Colour	Value	Multiplier	Voltage
Black	0	×1	10.0
Brown	1	×10	1.6
Red	2	×100	0.4
Orange	3	×1k	40.0
Yellow	4	×10k	6.3
Green	5	×100k	16.0
Blue	6		20.0
Violet	7	×0.0001	
Grey	8	×0.01	25.0
White	9	×0.1	2.5

Capacitors

Top band: First digit of value
Second band: Second digit of value (gives value in pF)

Third band: Multiplier

Fourth band: Tolerance—White 10%, Black 20%

Bottom Band: Voltage

Resistors

Bands from closest to lead:

First digit of value

Second digit of value

Multiplier

Tolerance

Colour	Value	Multiplier	Tolerance
Black	0	×1	
Brown	1	×10	1%
Red	2	×100	2%
Orange	3	×1 k	
Yellow	4	×10 k	
Green	5	×100 k	
Blue	6	×1 M	
Violet	7	×10 M	
Grey	8		
White	9		
Gold			5%
Silver			10%
No band			20%

Notes

1. 1% tolerance resistors have five bands. The first three give three digits of value, the rest as above.
2. Bands are closer to one end of the resistor. Read bands in sequence from this end.

Hexadecimal Constants

Hex Code	Most Significant Bytes		Least Significant Bytes	
0	0	0	0	0
1	4096	256	16	1
2	8192	512	32	2
3	12288	768	48	3
4	16384	1024	64	4
5	20480	1280	80	5
6	24567	1536	96	6
7	28672	1792	112	7
8	32768	2048	128	8
9	36864	2304	144	9
A	40960	2560	160	10
B	45056	2816	176	11
C	49152	3072	192	12
D	53348	3328	208	13
E	57344	3584	224	14
F	61440	3840	240	15

HEX TO DECIMAL CONVERSION
Decimal Value = IV + III + II + I

ASCII Character Codes as defined in ANSI X3.4

Dec	Hex	Char	Dec	Hex	Char	Dec	Hex	Char	Dec	Hex	Char
0	0	NUL	32	20	SPACE	64	40	@	96	60	—
1	1	SOH	33	24	!	65	41	A	97	61	a
2	2	STX	34	22	"	66	42	B	98	63	b
3	3	ETX	35	34	#	67	43	C	99	63	c
4	4	EOT	36	24	$	68	44	D	100	64	d
5	5	ENQ	37	25	%	69	45	E	101	65	e
6	6	ACK	38	26	&	70	46	F	102	66	f
7	7	BEL	39	27	'	71	47	G	103	67	g
8	8	BS	40	28	(	72	48	H	104	68	h
9	9	HT	41	29	)	73	49	I	105	69	i
10	A	LF	42	2A	*	74	4A	J	106	6A	j
11	B	VT	43	2B	+	75	4B	K	107	6B	k
12	C	FF	44	2C	,	76	4C	L	108	6C	l
13	D	CR	45	2D	-	77	4D	M	109	6D	m
14	E	SO	46	2E	.	78	4E	N	110	6E	n
15	F	SI	47	2F	/	79	4F	O	111	6F	o
16	10	DLE	48	30	0	80	50	P	112	70	p
17	11	DC1	49	31	1	81	51	Q	113	71	q
18	12	DC2	50	32	2	82	52	R	114	72	r
19	13	DC3	51	33	3	83	53	S	115	73	s
20	14	DC4	52	34	4	84	54	T	116	74	t
21	15	NAK	53	35	5	85	55	U	117	75	u
22	16	SYN	54	36	6	86	56	V	118	76	v
23	17	ETB	55	37	7	87	57	W	119	77	w
24	18	CAN	56	38	8	88	58	X	120	78	x
25	19	EM	57	39	9	89	59	Y	121	79	y
26	1A	SUB	58	3A	:	90	5A	Z	122	7A	z
27	1B	ESC	59	3B	;	91	5B	[	123	7B	{
28	1C	FS	60	3C	<	92	5C	\	124	7C	|
29	1D	GS	61	3D	=	93	5D	]	125	7D	}
30	1E	RS	62	3E	>	94	5E	→	126	7E	–
31	1F	US	63	3F	?	95	5F	_	127	7F	DEL

ASCII Control Codes

NUL	(Ctrl @)	Null	
SOH	(Ctrl A)	Start of Heading	
STX	(Ctrl B)	Start of Text	
ETX	(Ctrl C)	End of Text	
EOT	(Ctrl D)	End of Transmission	
ENQ	(Ctrl E	Enquiry	
ACK	(Ctrl F)	Acknowledge	
BEL	(Ctrl G)	Bell	
BS	(Ctrl H)	Back Space	
HT	(Ctrl I)	Horizontal Tab	
LF	(Ctrl j)	Line Feed	
VT	(Ctrl K)	Vertical Tab	
FF	(Ctrl L)	Form Feed	
CR	(Ctrl M)	Carriage Return	
SO	(Ctrl N)	Shift Our	
SI	(Ctrl O)	Shift In	
DLE	(Crtl P)	Data Link Escape	
DC1	(Ctrl Q)	Device Control 1	
DC2	(Ctrl R)	Device Control 2	
DC3	(Ctrl S	Device Control 3	
DC4	(Ctrl T)	Device Control 4	
NAK	(Ctrl U)	Negative Acknowledge	
SYN	(Ctrl V	Synchronous Idle	
ETB	(Ctrl W)	End of Transmission Block	
CAN	(Ctrl X)	Cancel	
EM	(Ctrl Y)	End of Medium	
SUB	(Ctrl Z)	Substitute	
ESC	(Ctrl [)	Escape	
FS	(Ctrl \)	File Separator	
GS	(Ctrl])	Group Separator	
RS	(Ctrl ^)	Record Separator	
US	(Ctrl _)	Unit Separator	

The RS-232C Interface

The basic RS-232C Electrical specifications

Communication rate:
0–20,000 bits per second

Driver output voltage levels, maximum no load:
–25 Untitled-2 logic 1, + 25 V logic Ø

Driver output voltage ranges for loads between 3 k and 7 k Ohms:
Logic 1: 15 V (7 k) and –5 V (3 k)
Logic Ø: + 15 V (7 k) and + 5 V (3 k)

Driver output current, short circuit:
500 mA maximum

Driver output impedance with power off:
300 Ω minimum

Maximum driver output slew rate:
30 V per microsecond

Receiver input resistance:
7 kΩ maximum
3 kΩ minimum

Effective receiver input capacitance:
2500 pF maximum

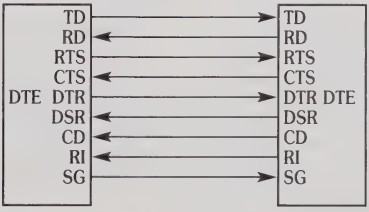
Maximum receiver input voltage range:
– 25 V to + 25 V

The following table shows the nine most common signals used for serial communications and their PIN allocations for nine and 25 PIN connectors:

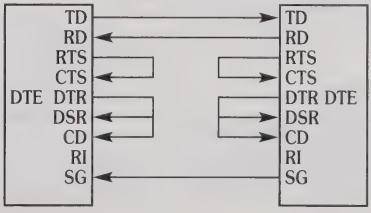
Signal Name		PIN No. (9 pin)	PIN No. (25 pin)
TD	Transmitted Data	3	2
RD	Received Data	2	3
RTS	Request To Send	7	4
CTS	Clear To Send	8	5
DSR	Data Set Ready	6	6
SG	Signal Ground	5	7
CD	Carrier Detect	1	8
DTR	Data Terminal Ready	4	20
RI	Ring Indicator	9	22

Common RS-232C Connections

Each signal (except ground) is either an input or an output depending whether it is on the Data Terminal Equipment (DTE) (eg, a computer terminal) or the Data Circuit Terminating Equipment (DCE) (eg, a modem). A typical connection is shown below.



When two computer terminals (DTEs) are connected together, a "null modem" hook-up is needed to fool each DTE into thinking that it is connected to DCE. A typical null modem connection is shown below.



BASIC AND DERIVED SI UNITS—CONVERSION FACTORS

Basic SI Units

Quantity	Name of unit	Unit symbol
Electric current	ampere	A
Length	metre	m
Luminous intensity	candela	cd
Mass	kilogramme	kg
Thermodynamic temperature	degree Kelvin	°K
Time	second	s

Derived SI Units

Physical quantity	SI unit	Unit symbol
Electric capacitance	farad	F = A s/V
Electrical charge	coulomb	C = A s
Electrical potential	volt	V = W/A
Electric resistance	Ohms	Ω = V/A
Force	Newton	N = kg m/s^2
Frequency	Hertz*	HZ = s^{-1}
Illumination	lux	lx = lm/m^2
Inductance	Henry	H = V s/A
Luminous flux	lumen	lm = cd sr
Magnetic flux	Weber	Wb = V s
Magnetic flux density	Tesla†	T = Wb/m^2
Power	Watt	W = J/s
Work energy, quantity of heat	joule	J = N m

*Hertz is equivalent to cycle per second.
†Tesla is equivalent to Weber per square metre.

Conversion factors

To convert	into	Multiply by	Conversely
Amp hours	Coulombs	3600	2.778×10^{-4}
Atmospheres	Lb/sq.in	14.70	0.068
Centigrade	Kelvin	°C+273 = °K	°K – 273 = °C
Cubic inches	Cubic feet	5.787×10^{-4}	1728
Cubic inches	Cubic metres	1.639×10^{-5}	6.102×10^{4}
Degrees	Radians	1.754×10^{-2}	57.3
Dynes	Pounds	2.248×10^{-6}	4.448×10^{5}
Ergs	Foot pounds	7.376×10^{-8}	1.356×10^{7}
Feet	Centimetres	30.48	3.281×10^{-2}
Foot pounds	Kilowatt hours	3.766×10^{-7}	2.655×10^{6}
Gausses	Lines per sq.in.	6.452	0.155
Grams	Dynes	980.7	1.02×10^{-3}
Grams per cm	Pounds per in	5.6×10^{-3}	178.6
Horsepower	Kilowatts	0.746	1.341
Inches	Centimetres	2.54	0.3937
Kilograms	Pounds (lb)	2.205	0.454
Kilometres	Feet	3281	3.048×10^{-4}
Kilometres	Nautical miles	0.540	1.853
Kilometres	Statute miles	0.621	1.609
Kilowatt hours	Joules	3.6×10^{6}	2.778×10^{-7}
Kilowatt hours	HP hours	1.341	0.7457
Knots	Miles per hour	1.1508	0.869
Lamberts	Candles per sq.cm	0.3183	3.142
Lamberts	Candles per sq.in	2.054	0.4869
Lumens per sq.ft	Foot candles	1	1
Lux	Foot candles	0.092892	10.764
Metres	Feet	3.28	10.764
Metres	Yards	1.094	0.9144
Miles per hour	Feet per second	1.467	0.68182
Nepers	Decibels	8.686	0.1151
Tons	Pounds	2240	4.464×10^{-4}
Watts	Ergs per second	10^{7}	10^{-7}

Ten Most Common Tower Building Mistakes

by STEVE MORRIS K7LXC

After working on over 100 amateur radio tower and antenna systems over the last 15 years, I have seen many problems and failures that could have, and should have, been avoided. By not making these mistakes, you can make your tower and antenna system safer and more reliable. It'll even let sleep at night better.

1. Not following the manufacturer's specifications

Commercially manufactured towers have to comply with current standards for wind loading and structural integrity. Licensed Professional Engineers (PEs) design the towers and make the calculations to make them safe. If you don't follow their specs at a minimum, the tower will not take the stresses and loads that it is subject to. In other words, it'll probably fail.

2. Overloading

This is the most common reason for amateur tower failure. The first thing you need to know to plan and build a tower and antenna system is what the wind speed rating for your country is. Next, you need the manufacturer's specifications for that wind speed. Then you must not exceed the wind load rating based on these factors. This is even more important for crank-up towers. Refer also to number 1.

3. Underestimating wind forces

Wind pressure on a tower and antenna can be tremendous. Unless you've been up on a tower during a windstorm to feel the pressure and the forces, it's difficult to appreciate how significant they are. Increases in wind pressure are not linear, they are geometric.

4. Not building to the wind speed rating for the county

While many counties are only rated for 70 mph winds, many other counties have rating much higher, up to 115 mph. Find out what the wind speed rating is for your county, or your specific location, and use that as the minimum design parameter for your tower and antenna system. See also numbers 1 and 3 above.

5. Using the wrong mast for the job

Medium to large sized HF beams can put huge stresses on your mast. Know the difference between pipe and tubing as well as the pressure that your antenna system will put on the mast (tubing is generally acceptable, pipe is not). Then you can make sure that your mast will not bend or break in a big windstorm.

6. Not having the guy wire tensioned properly

Proper guy wire tension is a critical part of a tower's ability to handle wind stresses. Having the wrong tension can be like driving your car with over- or under-inflated tyres: it is potentially dangerous and is not the proper specification from the manufacturer. Find out the proper tension for your installation and tension them correctly.

7. Not having a proper ground system

A good ground system is necessary not only for lightning protection but also for minimizing RFI to adjacent electronic devices.

8. Not doing an annual inspection

Your tower and antennas system is in a constant state of deterioration. While it may be a slow process, it is going on continually. The best way to find and fix small problems before they grow into big problems and potential calamities is by doing an annual inspection.

9. Not fitting the tower sections on the ground

Tower sections, new or used, may not fit easily together. It's much easier to correct alignment problems on the ground rather than up on the tower.

10. Using the wrong hardware

Since tower and antenna materials are in a constant state of deterioration, you should only use hardware that minimizes corrosion. Galvanized or stainless steel materials are the only ones that will survive outdoor use reliably. Using the wrong hardware includes using non-closed-eyebolts. Use only forged or welded eyebolts since the wrong type can open up accidentally with disastrous results.

Derek Fortune ZL1UF (B.Sc.) presents some useful pointers on this popular and rewarding pastime.

Construction of one's own electronics project was once a mighty undertaking. Several tubes and a bulky power supply were required to achieve almost any logic or amplifier function. Enter silicon . . . no longer the case!

"Building block" integrated circuits make easy the realization of ideas like a precise, linear, voltage-to-frequency converter. These devices were limited to the realms of theoreticians less than 20 years ago. How about a preamp device having a flat 20 dB gain and low noise from DC to over 2 GHz. It operates from almost any power supply voltage (change one resistor) and costs less than $10! The choice of project or device you might construct is almost limitless—test gear, home stereo and appliance control devices, projects for the car or boat, projects for the radio shack.

Choice of project

The classic beginners' text on electronics will describe several radio receivers, ranging upwards from the crystal set. Receiver projects are still very popular, and an amateur band transceiver project leads the licensed constructor into QRP (low power) operation. However, many people look towards something different. Magazines are forever spitting out new ideas for projects to build—whether you attempt a crystal set or a computer, there is a thrill in using the equipment you had a hand in making that is not available from the purchase of commercial, branded gear. You cannot help but teach yourself about electronics as you study someone else's circuit and explanations and then recreate it under your own conditions.

Not every project works from the first power-up; but the understanding of the project grows rapidly as the fault-finding technique progresses. If you cannot solve the problem yourself, you can usually find assistance from friends, clubs, or the project author as to finding the problem. Most authors are only too happy to discuss their project on the telephone, or in person. Letters like "it doesn't work, what can I do?" are much more difficult to answer. Interactive discussions allow the author to pose questions, and the two parties can converge on a likely solutioln.

Sources of designs

Magazines are definitely the best sources of varied, up-to-date projects. Until a few years ago *Electronics Today International* (*ETI*) was arguably the best publication available in this part of the world for a wide range of constructional articles for every purpose and skill level. *Electronics Australia* had, and still has, a regular trail of constructional projects on offer. Several European magazines have also run for years producing similar piles of potential projects. *QST* (published by the ARRL) and a host of other national amateur radio associations' magazines offer projects more selected toward the amateur fraternity. In New Zealand *Break-In* offers some excellent articles. If you have a pet project of your own design working well, get writing! Be sure to include a PCB layout with your article. Do contact a component supplier for details on currently available components before finalizing your design.

Many magazines of this nature are available through libraries. Some, like the Auckland University Engineering School Library, keep bound volume sets of each year's issues of many of these periodicals. Public libraries also keep desk copies available for reference use. Photocopiers are available in all these places for public use.

The annual index is usually included with the December issue of each magazine, so searching for articles on a given topic becomes quite easy. Radio Club libraries also can offer collections of books and magazines to the newcomer.

Choosing designs from Australasian magazines by preference is likely to give the least problems with obtaining components. Some European magazines especially are prone to use components which are very hard to get in New Zealand. More about this below.

Obtaining components in New Zealand

The Dick Smith chain still offers some discrete electronic components. However the range seems to be decreasing steadily.

Contact other local amateurs if you are looking for a component supplier in your region.

Printed Circuit Boards

PCBs for projects in many magazines are available. Marday Services in Auckland offers the PCBs for a number of *Electronics Today International* projects, as well as *Electronics Australia* and others. You can save a lot of time and trouble, especially if you are new to electronics, by obtaining the PCB to go with the published diagrams.

Construction techniques

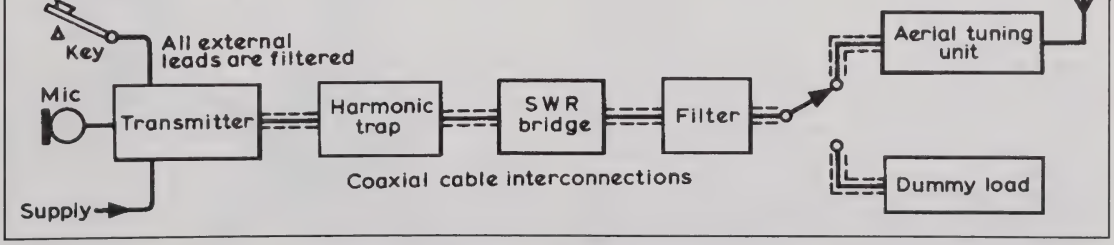
Beginning constructors are well advised to obtain a copy of the *ARRL Handboook*. This monstrous text is probably the single best book anywhere to introduce the enthusiast to every part of amateur radio and contains a chapter on construction techniques. Tools and hardware, soldering and metalwork are described in detail in this chapter. Good soldering technique and care of the soldering iron is very important as you progress beyond your first projects. Most tables you will ever need in amateur radio, from drill sizes to low-pass filter component values are contained in this mighty tome.

AC wiring technique needs to be given special attention in countries like ours which employ nearly the highest mains voltage in the world.One hundred and seventeen volts AC usually gives you a shock you can feel—but 230 V on the other hand, and a good earth on the other, is quite likely to give you something to remember, if you live to remember it at all! Do not use the nearest convenient piece of wire when connecting the mains input wiring for your project. Hookup wire with the normal thin insulation is NOT SAFE for use at 230 V. Avoid odd colours too—the use of conventional colours for mains wiring is strongly recommended. Brown should be used for Phase and blue for Neutral: then you can keep red and black for low voltage rails.

Ordinary three-core power flex is easy to split with a sharp hobby knife drawn along the cable from one end. Pull out the three wires and tear the jacket away from them. In this way you can tear along a length of cable for as much wire as required. This technique yields three correctly coloured, well-insulated, AC-rated wires, perfectly suited to the internal AC wiring required for the project.

Plastic sleeving, or even better, heat-shrink tubing, is easy to fit to the few connections that really matter in most projects. Heat-shrink tubing is available in short lengths in several colours and can be shrunk by several methods apart from the usual gun. Take the time over little things like these, and then you need not fear investigating the equipment whilst it is operating.

Keeping clear when the power is first turned on is not the point. If you make a wiring mistake, you will find it hard to spot if you have used red wire for all connections. You may discover it later; if you put the oscilloscope ground on the red wire going to earth for some reason, you may find it is actually the red wire going to Phase when the clip explodes between your fingers! (The scenario here is imaginary, but someone did do something very similar with my work 'scope once!)



Suggested layout of equipment for minimum spurious radiation.

ITU CLASSES OF EMISSION CODE

The basic characteristics of radio emissions are usually given in a three symbol group, such as A1A for Morse code.

These symbols are arrived at as follows:

First symbol—type of modulation of the main carrier.

Second symbol—nature of signal(s) modulating the main carrier.

Third symbol—type of information to be transmitted.

Modulation used only for short periods and incidental purposes, such as identification, may be ignored.

1. First symbol—type of modulation of main carrier

1.1	Emission of an unmodulated carrier	N
1.2	Emission in which the main carrier is amplitude modulated, including angle-modulated sub-carriers—	
1.2.1	Double-sideband	A
1.2.2	Single-sideband, full carrier	H
1.2.3	Single-sideband, reduced or variable carrier	R
1.2.4	Single-sideband, suppressed carrier	J
1.2.5	Independent sidebands	B
1.2.6	Vestigial sideband	C
1.3	Emission in which the main carrier is angle-modulated—	
1.3.1	Frequency modulation	F
1.3.2	Phase modulation	G
1.4	Emission in which the main carrier is amplitude and angle-modulated either simultaneously or in a pre-established sequence	D
1.5	Emission of pulses—	
1.5.1	Sequence of unmodulated pulses	P
1.5.2	A sequence of pulses—	
1.5.2.1	Modulated in amplitude	K
1.5.2.2	Modulated in width/duration	L
1.5.2.3	Modulated in position/phase	M
1.5.2.4	In which the carrier is angle-modulated during the period of the pulse	Q
1.5.2.5	Combination of the above	V
1.6	Cases not covered above in which an emission consists of the main carrier modulated in a combination of angle, amplitude, or pulse	W
1.7	Cases not otherwise covered	X

2. Second symbol—nature of signals modulating the main carrier—

2.1	No modulating signal	0
2.2	A single channel containing quantized or digital information, without the use of modulating sub-carrier*	1
2.3	A single channel containing quantized or digital information, with the use of a modulating sub-carrier*	2
2.4	Single channel containing analogue information	3
2.5	Two or more channels containing quantized or digital information	7
2.6	Two or more channels containing analogue information	8
2.7	Composite system with quantized or digital information together with analogue information	9
2.8	Cases not otherwise covered	X

*This excludes time-division multiplex.

3. Third symbol—type of information to be transmitted

3.1	No information transmitted	N
3.2	Telegraphy—for aural reception	A
3.3	Telegraphy—for automatic reception	B
3.4	Facsimile	C
3.5	Data transmission, telemetry, telecommand	D
3.6	Telephony—including sound broadcasting	E
3.7	Television (video)	F
3.8	Combination of above	W
3.9	Cases not otherwise covered	X

For a more complete description, the three symbol group may be preceded by a four symbol group representing the necessary bandwidth. This group must comprise three numerals and one letter, which must be H, K, M, or G. The letter is placed at the position of the decimal point in the number denoting the bandwidth in hertz, kilohertz, megahertz or gigahertz respectively.

The calculation of necessary bandwidths is complicated and only a few examples can be covered here. For CW Morse, the baud rate is 0.8 times the words per minute. The bandwidth is three or five times the baud rate, depending on the absence or presence of QSB. SSB Phone is just the highest modulating frequency. Double it for AM. FSK, RTTY (any code) is the baud rate plus 1.2 times the frequency shift.

Optionally, two more symbols may be added to the basic characteristics of emissions.

The optional additional characteristics are:

Fourth symbol—details of signal(s).

Fifth symbol—nature of multiplexing.

1. Fourth symbol—details of signal(s)

1.1	Two-condition code with elements of differing numbers and/or durations	A
1.2	Two-condition code with elements of the same number and duration without error-correction	B
1.3	Two-condition code with elements of the same number and duration with error-correction	C
1.4	Four-condition code in which each condition represents a signal element (of one or more bits)	D
1.5	Multi-condition code in which each condition represents a signal element (of one or more bits)	E
1.6	Multi-condition code in which each condition or combination of conditions represents a character	F
1.7	Sound of broadcasting quality (mono)	G
1.8	Sound of broadcasting quality (stereo)	H
1.9	Sound of commercial quality (excluding categories K and L)	J
1.10	Sound of commercial quality with the use of frequency inversion or band-splitting	K
1.11	Sound of commercial quality with separate FM signals for level control	L
1.12	Monochrome television or facsimile	M
1.13	Colour television or facsimile	N
1.14	Combination of the above	W
1.15	Cases not otherwise covered	X

2. Fifth symbol—nature of multiplexing

2.1	None	N
2.2	Code-division multiplex (including bandwidth expansion techniques)	C
2.3	Frequency-division multiplex	F
2.4	Time-division multiplex	T
2.5	Combination of F and T	W
2.6	Other types of multiplexing	X

Examples

25 wpm Morse on a local net:	060HA1AAN
25 wpm Morse on a DXpedition:	100HA1AAN
Classic HF Baudot RTTY:	1K07F1BBN
SSB Phone:	2K85J3EJN
AM Phone:	5K70A3EJN
So-called FM Phone on VHF:	16K0G3EJN
1200 baud Packet on VHF:	16K0G2DCN
9600 baud Packet on VHF:	13K2F1DCN
GPS satellite navigation:	100KG7DCC
On/off keyed Hellschreiber:	050HV1CAN

THE NZART RADIOSCIENCE EDUCATION TRUST

At the October 1998 "on-air" Council meeting the NZART Radioscience Education Trust received approval by Council and its final gestation is the result of many months of behind the scenes work by a few dedicated members of the Association.

How did it come about?

For some years it has been in the minds of a few people that our Association should, in keeping with the Objectives of its Constitution, help and encourage persons wish to further their education in the science of radio. Their vision was of a Trust that could afford to support and encourage students at all levels of education from primary school through to university. An anonymous donation, earmarked by Council for promotional use, was the catalyst for the realization of this vision. Initially this help and encouragement will be in the form of prizes and/or awards for the purchase of study material in their chosen discipline.

Saturday January 31 1998 was a "red-letter day" for the Trust when, at the NZART Council's "face-to-face" meeting, the official documents were formally signed, sealed and witnessed. At long last the Trust officially became a legal entity.

What is the NZART Radioscience Education Trust?

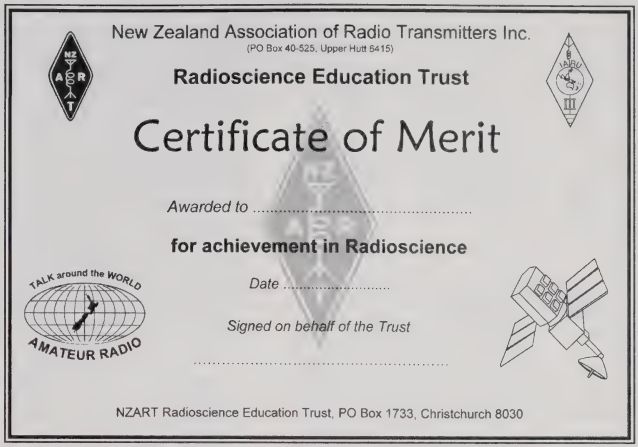
The Trust is a fund from which money will be made available for charitable purposes. The objectives of the Trust are set out in a Deed of Trust. It is structured to operate as a Charitable Trust to maximize the benefits to the recipients. It is governed by three Trustees who will be responsible for all aspects of the Trust's operation.

What are the Trust's objectives?

The objectives for which the Trust has been established are to apply the Trust's assets within New Zealand to promote and encourage education in radioscience, whether by payment of course fees for worthy candidates, the provision of prizes for excellence in educational activities, or otherwise as the Trustees think fit. Beneficiaries do not have to be members of NZART, nor will members receive preference.

How will the Trust work?

The initial intention is to provide prizes and awards for students offering a project or exhibit having a radioscience theme at local school Science and Technology Fairs. Organizing this activity will involve NZART members at national and Branch level throughout the country.


New Zealand Association of Radio Transmitters Inc.
(PO Box 40-525, Upper Hutt 5415)
Radioscience Education Trust
Certificate of Merit
Awarded to .....
for achievement in Radioscience
Date .....
Signed on behalf of the Trust
.....
TALK around the WORLD
AMATEUR RADIO
NZART Radioscience Education Trust, PO Box 1733, Christchurch 8030

Where does NZART fit into this Trust?

The Deed of Trust specifically sets the Association aside from any involvement. In effect, the Trust will be transparent to the Association since the awards, their control, and the financial aspects of the Trust are totally under the control of the Trustees.

How will the Trust's finances grow?

Following the inception of the Trust further amounts including a return from the 1997 NZART Conference organizing branches, has ensured growth of the Trust's funds to a worthwhile sum.

The Trust will operate from the income generated by the capital invested and the accrued interest will be used to finance the awards and prizes etc. The Trustees welcome inquiries from any person or organization wishing to support the Trust by donation; replies will be treated in the strictest confidence. The Trustees intend that the fund should grow in line with inflation to ensure on-going benefits.

The Trust has been granted "Charitable Trust" status with the IRD. Briefly, this means that the Trust's income is not taxable and that donations to the Trust are tax-deductible.

Who are the Trustees and how are they appointed?

The three Trustees are all NZART members of long standing who hold the Association, its aims and objectives at the highest level. The inaugural Trustees are:

Terry Carrell ZL3QL, Christchurch. Airline pilot, Past-President and NZART Councillor, NZART IARU Liaison Officer.

Peter Norden ZL2SJ, Papakura. Sales Manager, NZART Councillor.

John Walker ZL3IB, Christchurch. University Lecturer (retired), Editor *Break-In*.

The President, in consultation with the Vice-President, will appoint the Trustees as and when necessary.

The Science and Technology Fair organization

Nationally, the Science and Technology Fair scheme is sponsored by ECNZ and, at present, there are 22 regional Science and Technology Fairs whose winners go on to take part in the National Science and Technology Fair.

What are the prizes for?

The aims of the Trust are broad and we wish to support and encourage all and any aspect of radioscience. Relevance to amateur radio is a plus but not an absolute pre-requisite.

for the time being the Trust plans to sponsor a prize worth $100 at each of these local area Science and Technology Fairs. It is hoped that local NZART Branches will provide judges and other forms of support for these events. The Trust will also provide an attractively printed *Certificate of Merit* (for the prize winner) and *Certificate of Commendatio* (one or more of which may be awarded at the judges' discretion). Nevertheless a prize will not be awarded if the judges do not consider there to be a worthy recipient.

In the long term this two-way exchange should provide a means for generating interest in radio and electronics leading to more young radio amateurs. At the same time it should provide Branches with a means of local involvement and recruitment.

Looking ahead: let's talk about trusts, bequests and your will

By supporting the Trust you can partake in the development of new and exciting communications technology that is rapidly adding more options for a career, education, international understanding, and a wonderful pastime. You can help preserve this experience and pass it on to a new generation of New Zealanders by contributing to the Trust. You can be part of the future now!

It's quite natural to wonder about the future. Potential contributors may ask, in what way can they support the NZART Education Trust throughout a lifetime or beyond. You may have had in your Amateur Radio activity an experience that has enriched your life, or seen or heard of something special that you wish to help perpetuate. Perhaps the Amateur Service with its many facets of activity, and public service, has made a lasting difference to your life, education and career.

One of the many ways to ensure future interest in Amateur Radio, is by making a bequest to the Trust. The legally binding obligations on the Trust, as set out in its Deed of Trust, ensure that your donation will be preserved and used exclusively for the purpose you intend, the promotion and encouragement of education in radioscience. We recommend strongly that a solicitor provide assistance when you are considering a bequest, or any modification to your will, as the law must be considered when executing a bequest. Your solicitor can assist you to tailor your will to your precise needs.

The NZART Radioscience Education Trust is a Charitable Trust founded the NZART Inc to promote and encourage education in radioscience. The Trust's income is tax-free and donations to the Trust are tax-deductible to the extent permitted by the Income Tax Act 1994.

Correspondence regarding the Trust and contributions should be addressed to: The Trustees, NZART Radioscience Education Trust, C/- PO Box 1733, Christchurch.

compiled by
MURRAY GREENMAN
ZL1BPU

Many amateurs now have a computer that they use for their hobby, whether for general uses such as word-processing, electronic design, Packet radio, HF operating, log keeping or a host of other tasks. With a modem in the computer connected to a normal telephone line, and an Internet account, you can access e-mail, mailing lists and news services, and the "world wide web", widely used for research, information and sourcing software.

Some say that the Internet may cause the demise of Amateur Radio as we know it, and it has already had a marked impact on Packet radio systems. However, most Internet-using hams recognize that it is one of the most powerful tools available, and use the Internet to enhance their hobby, rather than supplant it. What better way to look up the address of a station you want to QSL, to look for modifications or improvements for your rig, a design for an antenna, connection details for some piece of equipment, or to promote your next Club meeting or Field Day!

The Internet is a highly diverse network of interconnected computers, rather like a very fast Packet radio network on a grand scale, and indeed uses a similar protocol, called (surprise!) the "internet protocol" or IP. Some of these computers have specialized purposes, such as providers of information ("servers" or "hosts"0, traffic directors ("gateways" and "routers"), while others, like yours, are information users ("clients"). Most of the systems are active all the time, although the interconnections between them are dynamic, and exist only while the connection is in use. They can be interconnected via telephone lines, microwave links, fibre optics and satellite links.

Most home users connect up only when necessary, using a regular telephone line. Your point of connection is a computer (operated by your Internet Service Provider or "ISP"), connected to you via the telephone exchange and to the Internet via some type of fast link. ISPs charge for their services in different ways—some are flat rate, others charge by the minute or the megabyte. The type of account which will best suit you will depend on your usage. For example, if you intend to do a lot of research (or "surfing" for pleasure), choose a flat rate account. If you need only e-mail, choose a charge by the minute account. Commercial sites with permanent connection to the Internet are generally charged by the amount of data transferred.

There are many services provided by an Internet connection. It is well beyond the scope of this introduction to provide a list of Amateur Radio services, and besides, not only do these services (called "links") change almost daily, they are best discovered when you need them by using a search tool. Some of the more useful links are listed later.

WWW

Perhaps the most widely publicized Internet service is the "World Wide Web". In reality, the WWW is just one part of the Internet, a vast collection of information servers which understand a particular set of protocols, supplying data in a format recognized by PC "Internet browser programs" such as Internet Explorer or Netscape. Web documents, called "pages" are written in a "hypertext markup language" or HTML, with pictures, sounds and other items linked to them. The hypertext concept allows pages and other files to be interconnected or linked anywhere in the world.

The WWW is widely used as a research tool and information provider. For example, check out a call-sign using the QRZ database,[1] or current ionospheric propagation data from Australia.[2]

One of the most powerful tools provided by the WWW is the "search engine", a special web site that has the task of finding out all about other sites. Most have a huge database of references, which can be maintained automatically, manually, or updated from submissions provided to them,[3] and will give you a list of references almost instantly. Another type will accept a request to do your research for you, and post back the results by e-mail! The trick with search engines is to specify exactly what you are looking for—otherwise you have to wade through too many references to find exactly what you want.

Some amateurs also provide a WWW web site as a service to others. Many of these have a highly professional appearance. Creating a simple web site is really easy to do. You need to know a little about HTML, have an ISP to "host" your data, and know how to load the data.

E-mail

Electronic mail, or "e-mail" is perhaps the most useful and widely used Internet service for amateur radio. It is also incredibly cheap and fast. You can keep in touch with friends, set skeds, send pictures, software or even sounds or picture samples from your DX contacts! Some experimental contacts have even been co-ordinated in near real time via e-mail.

E-mail is especially useful if you and your friends are involved in some particular development project—maybe a new antenna design, or a propagation experiment. Most e-mail systems can be fully automatic, and your mail simply arrives on your PC to be read and replied to at your leisure. You can send file attachments—even pictures, sounds and programs along with the e-mail. Most mail systems now accept mail in HTML format, so you can also used coloured backgrounds and text, pictures, letterheads and special fonts.

There are two further variants to e-mail. WWW e-mail is a way to have a mail service without having an e-mail service provider. There are many WWW mail providers, and some are free.[4] WWW mail can be read from anywhere in the world, and can be anonymous, but is also inconvenient, since it does require a WWW connection and must be manually read. A WWW e-mail address is no different to a normal address, but is "served" to the user in a different way.

The other variant is the e-mail "reflector", or list. This is a computer system on the Internet which receives e-mails, and then sends them to every e-mail address on the requesting list. This is a very powerful way to keep Amateurs with similar interests in touch with each other. To send an e-mail to everyone with the same interests, you just send one e-mail to the list address. Lost address problems are few, because the subscribers make sure that their details are current.

There is a reflector for PSK31, another for Hellschreiber, one for MT63, one for HF digital mode developers, and a host of DX spotting reflectors.[5] Many of these reflectors are provided as a free service, and you can easily start your own, for example, using Onelist.[6]

E-mail is generally read (or "downloaded") over the Internet using an e-mail tool such as Eudora or Outlook Express. It is possible to access e-mail via a direct dial-up using Telnet, or even via the Packet radio network, if forwarding is set up. Most e-mail providers allow you to read mail from anywhere in the world, wherever you have access to the internet, via a friend's account or perhaps a "cyber café".

News

The Internet news service is really like a massive public bulletin board. There are many thousand different topics available (called "newsgroups"), and you can read or post messages to these in a similar way to e-mail. Just remember though that newsgroups are highly public—anyone in the world can and will post to them, so you are likely to see some information you would rather not see, and if you send mail to a newsgroup you are at risk of receiving unwanted mail.

Newsgroups are very powerful for advertising and promotion, since they are so public. However, they are not widely understood, and are open to abuse. An excellent example of a newsgroup that works well is the New Zealand buy/sell/swap newsgroup.[7] Newsgroup topic names have a hierachy—look for recreational topics like rec.radio.antenna, rec.radio.digital or rec.radio.space.

Most e-mail programs will also handle newsgroups, and will allow you to search for and join the groups which interest you.

FTP

File Transfer Protocol is the mechanism most used to send files across the Internet safely. You won't need to know how it works, only that your web browser or file manager probably supports the protocol, so you can download programs. FTP is also used to move files to a server when you set up your own Web site.

Private and commercial sites require a password for FTP access. Sites such as ftp://ftp.tapr.org/tapr are designed for "anonymous FTP", so anyone can make file transfers.

Web servers are like any other computer and, in theory, you can also access any web file using FTP. In reality, however, many of the commercial sites prohibit anonymous FTP access. Using FTP on web sites is a good way to explore a site, find data that is not mentioned on the web pages, or to diagnose a linking problem.

Telnet

Telnet provides a basic method of connecting one computer to another rather like connecting two terminals together. No error correction process is used. Telnet forms the basis for all Internet login processes and can be used to run commands on the remote computer.

Internet addresses

Computers on the internet have numerical addresses, rather like a large telephone number. Because these change from time to time, and are difficult to remember, a text address form is used, which is translated to numbers when required by a "name server". The text address is called a "Unified Resource Locator" or URL, of the form "type://address.organisation.country/director/filename", so the URL points directly to a precise file or resource on a distant server. The country abbreviation for New Zealand is "nz", for Australia is "au", and for Canada is "ca" and so on—since the Internet started in the USA, the US has no country abbreviation.

For example, http://www.qsl.net/zl1bpu/index/html is the URL for my web site. "http" means that the protocol to use is "hypertext transfer protocol", so the resource is an HTML page, the page is at the popular web site QSL NET, (the country is the US by default), and the file index.html is in the server directory "zl1bpu". This is a real address—try it!

URLs are case sensitive—it is important to maintain the exact upper and lower case letters, or the data you want will not be found. Often you will find the page you want can't be found anyway—its address may have changed, or it may be temporarily unavailable.

E-mail addresses are of the form "name@address.country", and unlike URLs, are not case sensitive—although it is conventional to use lower case. For example, the e-mail address as149@detroit.freenet.org, is based in the United States, although it can be read from anywhere.

Chat

A chat server is a device designed to accept short messages from users and send them to other users almost in real time. In effect it is like running a live Packet radio contact, where you chat to other users one line of text at a time. Chat servers are divided into "rooms" or subjects, which you can enter and leave. When you enter or leave, your movements are reported to the other users. There are many chat rooms dedicated to amateur radio subjects, and conventionally the users identify themselves by call-sign, so operation is very similar to Packet radio contact. Some of the Amateur Radio chat rooms do in fact connect live to the Amateur Packet radio network in different parts of the world.

Some of the more sophisticated chat servers allow real time data transfer direct to an individual client, rather than a chat room. ICQ is such a system, and is popular for co-ordination of HF propagation experiments. Internet Phone servers can do the same with Voice and image data.

Your own Web Site

There are more useless and self-serving web sites than you could ever imagine, but there will always be room for a new Amateur Radio web site that serves a useful purpose. To set up a web site, you need a web service provider to host your data, some means of creating and editing HTML files and image files, an FTP tool to send the files to the host, and an Internet account for access.

If your web site is dedicated to Amateur Radio, you can make your own web site absolutely free with QSL.NET.[8] They offer as much space as you need, with no strings attached and the service is very good. There are many other free sites, but they usually involve attached advertisements one way or another.

Although you do not need to learn HTML to write web pages, it is very useful to know a little about the process, as your site will work best and be served to users faster if the pages are small and efficient. Many modern word processors will save in HTML format, but the files will be large and slow loading. It is quite practical to write effective HTML with a simple text editor such as "Notepad". Use a beginners' HTML guide from the Internet to learn how to write pages, link them together, and embed pictures, and so on.

Your new web site can be completely tested on your own computer, and once you are satisfied with it, the whole site, or one file at a time, can be transferred to your web host by FTP. Then—most important step—test it all again over the Internet, before you make the web site public. There are several ways to publicize your new web site—by e-mail, of course, via newsgroups, other web sites, or best of all, but telling the major search tools[3] about it.

Web sites need to be maintained—it is amazing how quickly the data becomes outdated—and if you use links to other sites, these especially need to be tested regularly, as they are sure to change. Your reputation will suffer if your site is out of date, does not work properly, or is visually "tacky".

Amateur Radio sites

It is not possible to list even more than a few of the Amateur Radio Internet sites—there are so many! There are general purpose sites,[9] associations like the ARRL and NZART,[10] sites with satellite tracking data,[11] vintage radio,[12] software sites[13] and so many more. Use one of the general purpose sites with plenty of links to locate what you need. You can even listen to HF and VHF radios and tune them up and down the band via the Internet![14]

References

1. www.qrz.com.
2. ionosphere.kel.com.au.
3. www.excite.com, www.altavista.com, www.yahoo.com.
4. www.hotmail.com, www.juno.com.
5. users.southeast.net/~kd4ujk/ficada2.htm.
6. www.onelist.com.
7. nz.wanted.
8. www.qsl.net.
9. www.eham.net, www.ac6v.com, www.hamradio-online.com.
10. www.arrl.org, www.nzart.org.nz, www.tapr.org, www.amsat.org.
11. acsprod1.acs.ncsu.edu/scripts/HamRadio/sattrack.
12. www.vistech.net/users/w1fji/museum.html, www.halcyon.com/johnj/radios.
13. aintel.bi.ehu.es/psk31.html, space.tin.it/computer/aporcino, www.hffax.de.
14. www.ralabs.com/webradio.

WARO New Zealand Women Amateur Radio Operators — Call-sign ZL6YL

Object

To promote and encourage interest in Amateur Radio amongst women.

WARO was formed in 1961–62 by a small but keen group of YL transmitters and has steadily grown both in numbers and enthusiasm ever since.

For the annual subscription (constantly under review, currently $10.00 for New Zealand members) members receive four quarterly Bulletins containing items of interest to operators and friends, with special attention to YL activities.

Associate members—YLs who do not have a transmitting licence are welcome, as are YLs from overseas, many of whom are sponsored by ZL members.

The Thelma Souper Memorial Contest is held annually in early April in honour of our founder. It is open to YLs and OMs and is held on the lower end of the 80 m band.

The WARO Achievement Award may be awarded annually to persons nominated by their peers for outstanding achievements in any aspect of Amateur Radio. Nominations close at the end of March each year and the Award is presented at the AGM in June. The form this takes is the Myrtle Earland Memorial Rosebowl in honour of New Zealand's first licensed YL.

WARO also operates several awards including the WARO Award and the Mountain Buttercup Award. For further details on these see the Awards section elsewhere in this Call Book.

Elected Officers

Patron:
Pearl Neilson ZL2QY.

President:
Biny Owen ZL2AZY.

Vice-President:
Bev Osborne ZL1OS.

Secretary:
Jacqueline Goodenough ZL1JAQ.

Treasurer and Membership Applications:
Sharon May ZL3AE.

Executive:
Ann Hotson ZL1ANN.
Bev Gillman ZL3TCR.
Rosemary Boshier ZL1WRO.
Jeanne Gilchrist ZL4JG.

Award Custodian:
Carolyn Sarten ZL2JP.

Contest Manager:
Carolyn Sarten ZL2JP.

Bulletin Editors:
Joline Beale ZL1UJB.
Biny Owen ZL2AZY.

Official Broadcast:
Cathy Purdie ZL2ADK.

Sponsorship Secretary:
Celia Reed ZL1ALK.

Librarian and Columnist:
Margaret McConnachie ZL3UD.

YL Nets:

All times NZT unless stated otherwise.

WARO VHF
Auckland: Sunday 1900z 146.900 (Bombay 690).

Canterbury: Monday 2100z 147.250 (Canterbury 725).

WARO HF
WARO: Mondays 2000z 3695 MHz ±.

Executive: Second Sunday 2000z 3695 MHz ±.

International
ALARA: Mondays 1030 UTC 3580 MHz ±.

YL "222": Mondays 0600 UTC 14.222 (Net Control Dave ZL1AMN).

VK6DE: Fridays 0400 UTC 21.188 MHz (mostly VK and ZL).

VE/VK/ZL: Fridays 0500 UTC 14.148 MHz.

BYLARA: Wednesdays/Saturdays 1115z BST 7050/7090 ± QRM.

CLARA: Tuesdays 1700 UTC 14.120 MHz (Alternate frequency 14.180 MHz).

YLRL:

YL ROSES—Mondays 1800 UTC 28.433 MHz.

QCWW—Tuesdays 1800 UTC 14.295 MHz.

YL Open House—Wednesdays 1900 UTC 14.288 MHz (one hour earlier daylight savings time).

Tangle Net—Thursdays 1800 UTC 14.298 MHz.

European DX/YL: Thursdays 1700 UTC 14.242 MHz ±. (Net Control Christine GM4YMM).

Italian YL: Mondays 1400z GMT summer/ 1300z GMT winter 7070 MHz ±.

Finnish TL: Sundays 3688 or 3710z (Phone) 3533 or 3522 (CW) no times given.

DX sponsorship

It is great to sponsor a YL from another YL organization—increases your awareness of other countries and their people. We have DX-sponsored members from all over the world and it does help to forge greater bonds between all of us. To sponsor a YL contact the Sponsorship Secretary for further information and contacts. It costs the value of a DX membership subscription and the chance to exchange news and views with each other.

YL Get-Togethers

These are held regularly throughout the country as well as the annual Get-Together at the time of our AGM in June. Consider going along to these affairs—they are a lot of fun.

WARO Bulletin/*Break-In* page

Copy is always required for these publications and any news/views of/by or from members are very welcome by the two persons concerned. Photographs are especially welcome—how about sending some in NOW.

Enquiries are always welcome from any YL for membership/fellowship in all of our activities. Feel free to contact any of the abovementioned YLs or any other member of WARO. And always be on the lookout for ZL6YL—our own callsign.

YL Activity Days

Aims: to meet and get to know many of the YLs normally only contacted briefly in contests, without the contest pressure. To have more personal QSOs than is possible in a formal YL Net. To meet old and new friends without the necessity of making numerous skeds.

Date: The sixth of every month.

Frequencies: Around 14.288, 21.188, 21.388, 28.688 MHz.

Times: On the hour, every hour. Call CQ YL if no YLs heard. Others may be listening!

CHRISTCHURCH VHF DX GROUP

Services provided the the Christchurch VHF DX Group.

10 m beacon

ZL3TEN 28.228 MHz. Antenna, half-wave vertical. Power output 10 W. Location: Rolleston.

6 m beacon

ZL3SIX 50.040 MHz, Antenna, 2 switched phased arrays beaming north-west and north-east. Power output 40 W. Location: Rolleston.

Trustees for above

Ross Johnson ZL3ADT
Mike Foubister ZL3TIC

Phone patch

Frequencies

144.180 MHz input/88.5 Hz sub-tone

438.800 MHz output, full duplex.

Location

Christchurch

Trustee

Wayne Garraway ZL3TCV

Club call-sign

ZL3MUF

SPAM—Society for the Preservation of Amplitude Modulation

Secretary/Treasurer

Roy Symon ZL2KH
25 Annandale Street
New Plymouth 4601
Telephone (06) 758-2156
Fax: (06) 758-2154
Cellular: (025) 245-1406
Email: zl2kh@taranaki.ac.nz

Librarian and Archivist

Phillip Brown ZL2IM
20 Nevada Drive
New Plymouth
Telephone (06) 757-8711

Meetings

Held annually at Queen's Birthday Weekend in conjunction with NZART Conference.

Aims and Objects

To preserve Amplitude Modulation as a means of Amateur Radio communication.

Nets

There are nets operating at present on AM on 3.850 MHz at the following times:

Monday to Saturday at 0900 hours.

Monday to Friday at 1900 hours (Petone based).

Wednesday evenings at 2030 hours (Taranaki based).

Friday evenings at 2000 hours (Northern area based).

A regular monthly net is held on SSB (LSB) on 3.593 MHz at 2000 hours on the fist evening of each month—so the day of the week will change—to discuss AM matters including who needs what and who can possibly provide the same—Members are encouraged to participate.

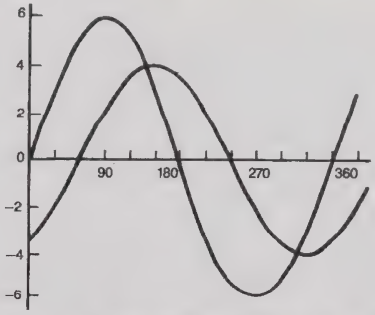
A national database of information and parts' sources, and wants, has been set up so that those seeking can be joined up with those willing to provide. All enquiries or offers of assistance should be directed to me on the air or at the above address.

General

In order to keep expenses to a minimum, membership lists, financial statements, information, etc, sought by members will be sent on receipt of a stamped and addressed envelope. The information sought will be sent as soon as possible.

Subscription

$5.00 payable once only on joining. A collection will be taken up each year at the Annual General Meeting, and donations will always be acceptable.



NZART AFFILIATES

A document in the NZART Councillors' Handbook, the NZART Policy 1998, reads:

31 General

31.1 The following are NZART affiliates:

31.1.1 Old TImers' Club (OTC).

31.1.2 Women's Amateur Radio Organization (WARO).

31.1.3 Cook Islands Amateur Radio Club

31.1.4 Kapiti Coast Museum.

31.1.5 Canterbury Amateur Radio Development Society (CARDS).

31.1.6 Suburban Amateur Radio Club (SARC).

OLD TIMERS' CLUB (ZL)

The objects of the Old Timers' Club (ZL) are set out in our Constitution adopted in 1993. They are as follows:

1. To recognize service to Amateur Radio;

2. To revive and maintain interests and good fellowship among the older members in the common cause.

3. To offer advice and encouragement to newer Amateurs.

The Club is duly affiliated to the New Zealand Association of Radio Transmitters (Inc).

Patron: Harry Martin ZL1PX

Grand Old Man: Tom Duxbury ZL1CZ

Secretary: Peter Anderson ZL1LR

Net Controllers:
Roy Symon ZL2KH
Don Dalrymple ZL3SZ
Brian Lawn ZL2AJS
Jack Leitch ZL2ASL
Bill Hoogeveen ZL2BQX
80 m AM Phone—Doug Alexander ZL2AWF

Districts Representative Committee:
H. Martin ZL1PX, G. Rouse ZL1AQ, E. Belcher ZL3QY, V. Jackson ZL4BO, D. Dalrymple ZL3SZ, D. Bradfield ZL1DAQ, C. Cumming ZL4OE.

OTC Scribe: Roy Symon ZL2KH.

Certificate Preparation and Assistant

Secretary: Anne Anderson ZL1TAF

A National Single Side-band Net is held every Sunday morning at 9.30 am. The call-sign is ZL6OTC. The frequency is 7.058 MHz but if propagation is poor on 40 m, the net may QSY to 3.865 MHz. An AM Net is also run on Sunday morning at 10.30 am on 3.850 MHz. The Secretary gives the Club News at 10.00 am on the SSB Net.

Full membership is available to any holder of a ZL call-sign who has held an amateur licence for the last 25 years or more and is still an active amateur.

In addition, Associate Membership is available to any ZL amateur who has attained the age of 60 years (and over) and has been an active amateur for 10 or more years. Voting privileges are not available to Associate Members.

Application Forms for membership may be obtained from a District Representative or from the National Secretary. A joining fee of $10.00 is payable on application.

Evidence of eligibility which is to be submitted shall include, full name, present call-sign, original call, operator's certificate number and date of original licence. All applications for membership shall be proposed and seconded by present OTC members.

Although there is no fee or annual subscription, a donation is appreciated on joining to cover costs of certificates, *Blue Book* and postages.

On acceptance a Certificate is issued to all Full and Associate Members, and they will be listed in the *Blue Book*. In addition further handsome certificates are available on request to those who attain 50, 60 and 70 years of Amateur Service.

All members of OTC are eligible to wear the Peacock Blue NZART Badge with call-sign so long as they are financial members of NZART. This badge is available from NZART HQ at the current price of the similar black membership badges.

Articles relating to all aspects of OTC or of vintage radio for publication in the OTC section of *Break-In* are welcomed by, and should be addressed to our Scribe, Roy Symon ZL2KH, 25 Annandale Street, New Plymouth 4601.

All correspondence should be addressed to the National Secretary: Peter C. Anderson ZL1LR, 32 Gilmour Street, Waihi 3061. If a reply is expected, please enclose a stamped, self-addressed envelope.

KAPITI COAST MUSEUM—WAIKANAE

The Waikanae District Museum was established in 1984 in the old Post Office Building, 9 Elizabeth Street, Waikanae—the Post Office building dating back to 1907. The driving force behind the radio collection consisted of George Anderson ZL2JG, Roy Curry ZL2AIP, Reg Danrell ZL2DR, Len Simpson ZL2HH, Les Wright and Dr Philip Bray.

The name was changed to Kapiti Coast Museum in 1993 to reflect the change in local authority organization. The interior of the building was radically upgraded during 1993/94, more emphasis placed on local history and the museum, under its new name, and was re-opened in October 1994 by the Rt. Hon. Doug Graham.

The radio collection includes a good range of domestic receivers, ZL2AB's original station (1923), and ZL4GE, now ZL2JG, 1933 Hartley transmitter. The ZL2GX collection of Collins, National HRO and other receivers is on display. The Amateur station ZL6KCM is affiliated to NZART and RSARS and vintage equipment operated.

Pictured is George Anderson ZL2JG, backed by a number of the classics of yester-year.

A collection of early domestic receivers dating from 1925. ZL2AB's original station is displayed in the foreground.

The museum also has a collection of telegraph keys and associated instruments plus a very good display of telephone equipment.

The museum is interested in obtaining items of historical interest and always keen to welcome new members to assist with the management of the museum and restoration of exhibits. The museum is open from 2pm to 4pm Saturday and Sunday and all Public Holidays. The museum can be opened outside these hours on request by contacting Neville Harris (04) 293-2359.

JAMBOREE ON THE AIR October 21 and 22 2000

by JIM PARNELL ZL2APE

The Jamboree on the Air (JOTA) provides international Scouting and Guiding communication by amateur radio. It has been held annually since 1958 and every year Scouts and Guides are encouraged to invite radio amateurs to help them take part. And they have taken part in great numbers—in recent years there being up to 500,000 Scouts and Guides involved in JOTA from about 10,000 amateur radio stations.

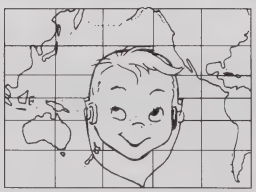
The potential benefits of JOTA to amateur radio in encouraging young people to take up amateur radio as a hobby are great. So it is in the interest of New Zealand amateurs to anticipate an invitation by Scouts and Guides and to approach their leaders, offering their services and equipment.

The easiest way for Scouts and Guides to take part in JOTA is for them to visit an amateur station sometime during the JOTA period. At the station, the amateur establishes a contact with another amateur station and then hands over the microphone to the Scouts and/or Guides. Satellites, Packet, SSTV and other modes of communication (including e-mail) are now used for JOTA as well as the normal modes using HF and VHF/ UHF.

Many stations are set up at Scout or Guide Headquarters, or at some local "interesting" or appropriate venue. Other JOTA stations are set up at camps, the radio activities being incorporated into the camping programme.

JOTA is now run concurrently with the Jamboree on the Internet (JOTI) and both JOTA and JOTI stations are often combined on the same site. There is much information about JOTA and JOTI on the New Zealand Scouting web page: www.scouts.org.nz/.

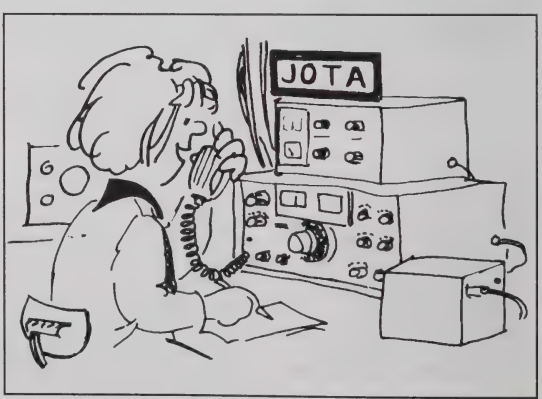
JOTA and JOTI are both co-ordinated by the World Scout Bureau and are organized by National Organizers in each Scouting and Guiding country.



JOTA is *always* held during the 48 hours (local time0 of the third full weekend in October. *In the year 2000, JOTA will be held on October 21 and 22 (which is Labour Weekend).* Activity may continue into the Monday if desired so that Scouts and Guides on the other side of the International Date Line may be contacted for a longer period.

Christine Ramsey ZL1LQ, xtine.r@xtra.co.nz organizes JOTA for the New Zealand Girl Guides on my behalf.

Jim Parnell ZL2APE
National Organizer for JOTA in New Zealand
Use Call Book address, or
jim-p@ihug.co.nz



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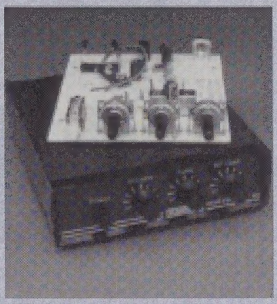

- QRP Transmitters
- HF Receivers
- 20 m Transceivers

Test Equipment

- Frequency Counters
- Signal Generators
- RF Service Monitor
- Sinad Test Set

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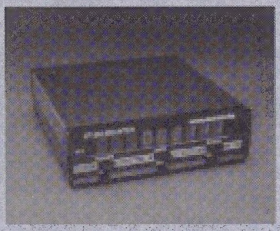
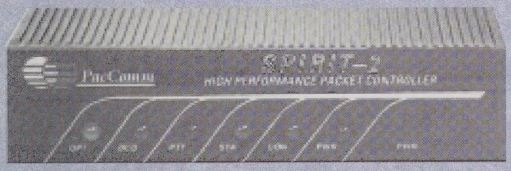
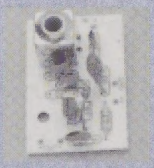


- DSP Audio Filter
- Computer Interface
- Phone Patch
- Antennas

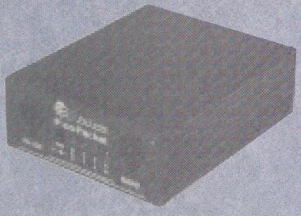
Packet Equipment

- TNCs
- Modems
- Networking Components
- Software





and more ...
Steve Davis ZL2UCX



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